THE ROLE OF ABILITY TO PAY AND INTERNAL LABOR MARKET PROCESSES IN WAGE AND GENDER-RELATED WAGE DIFFERENTIALS

by

TERESA L. SMITH

DISSERTATION submitted to the Faculty of the
Virginia Polytechnic Institute & State University
in partial fulfillment of the requirements for the degree of
DOCTOR OF PHILOSOPHY
in
General Business

APPROVED:

Frederick S. Hills, Chair

T. W. Bonham

Kent F. Murrmann

K. Dow Scott

Kent B. Monroe

July, 1989
Blacksburg, Virginia

THE ROLE OF ABILITY TO PAY AND INTERNAL LABOR MARKET PROCESSES IN WAGE AND GENDER-RELATED WAGE DIFFERENTIALS

by

Teresa L. Smith

Committee Chairman: Frederick S. Hills
Management

(ABSTRACT)

This research attempts to identify factors that influence wage and gender-related wage differentials across organizations. Specifically, the purpose was to investigate the role of ability to pay, willingness to pay, and organizational characteristics in wage determination and the development of gender-related wage differentials at the organizational level.

The sample chosen for the study included 160 doctoral-granting, public universities across the United States. Average wages at three levels of full, associate and assistant professor ranks were examined. Results of the study indicate that ability to pay and willingness have a significant positive impact on wages across organizations. The organizational characteristics of size, geographic location and unionization also have a significant impact on wage determination.

Results also indicate that even after accounting for the influence of ability and willingness to pay and

organizational characteristics on wages, the percentage of women in the organization still has a significant negative effect on wages at all ranks, and on the wages of both men and women. Findings further suggest that there is a significant differential betweeen the average wages of men and women both within and across the universities that is not accounted for by the structural characteristics of the organization.

ACKNOWLEDGEMENTS

I would like to express my sincere appreciation to the many people who have helped me throughout this Ph.D. program. I would especially like to thank my dissertation committee, Dr. Frederick Hills, Dr. T.W. Bonham, Dr. K. Dow Scott, Dr. Kent F. Murrmann, and Dr. Kent B. Monroe for their valuable insights and assistance. Sincere thanks also go to my Chairman, Dr. Fred Hills for his guidance and encouragement throughout this long process. I would finally like to express my love and thanks to my parents, my sister, and my brother-in-law for their help and support in this and all my endeavors.

TABLE OF CONTENTS

TABLE OF CONTENTS (con't)

TABLE OF CONTENTS (con't)

LIST OF TABLES

LIST OF TABLES (con't)

CHAPTER I

INTRODUCTION

NATURE OF PROBLEM

Wage differentials between men and women have existed since people were first paid for their labor, as evidenced by the much quoted verse from the book of Leviticus in the Old Testament which said that men's measure would be fifty shekels while women's would be thirty. One hundred years ago in the United States, over seventy five percent of all employed men earned over $1.00 a day while the majority of employed women earned less than $.75 (Stevenson, 1984).

In the past twenty years in the United States, a tremendous increase in the labor force participation rate of women has occurred. Along with this change have come extensive social changes and structural changes in the nature of work itself. One thing that has not changed substantially in the past twenty years is the ratio of men's to women's earnings. Although some figures have shown recent narrowing of the gap (O'Neill, 1985), full time earnings of women have remained at about seventy percent of men's throughout the period.

Empirical studies measuring the gender-related differential in earnings have analyzed the difference by comparing wage differences between men and women with differences in their economic contribution or productivity

to the organization. Studies have followed the general format of systematically adjusting for all of the factors believed to result in women's earnings being less than men's, (e.g. age, education, experience, occupation, hours worked), and then referring to the residual or unexplained difference as discrimination against women (Lloyd and Niemi, 1979).

The underlying reasons for the differential in earnings remain controversial (Filer, 1983). The kinds of explanations that have generally been utilized to account for the earnings differential between men and women include human capital studies and occupational segregation studies. Human capital studies explain the gender-related wage differential in terms of differences in the characteristics of workers which affects their productivity and subsequent earnings. Occupational segregation studies explain the differential in terms segregation of women into lower paying occupations than men (Treiman and Hartmann, 1981). A third explanation of the gender-related wage differential that will be the focus of this study is that the differential is due to differences in the characteristics of the organizations by which women are employed and because of those characteristics, the organizations can only afford to pay lower wages. If women are more often employed by lower wage organizations they will consequently earn less than men.

One reason why there are many explanations for the gender-related wage differential is that none have successfully explained it. A major problem with past work on the male-female wage differential is that the studies vary widely in their findings of how much of the differential is explained by the factors included. Studies have reported explaining as little as none of the differential to over seventy percent of the differential. The huge variability in findings is due to 1) differences in variables included; 2) differences in data; and 3) differences in the meaning of earnings and how earnings is operationalized as the dependent variable (Mellor, 1984).

Because of the huge variability in empirical findings and the persistence of the unexplained differential, the traditional neoclassical economic explanations for the wage differential of human capital differences and occupational differences are "simply grossly inadequate". The reality is that the differential is largely unexplained and has not been eliminated through the long run operation of competitive forces in the labor market as predicted by traditional theory (Dunlop, 1985:31).

PURPOSE OF STUDY

The purpose of this study is to examine gender-related wage differentials across organizations and the role of ability to pay wages in wage determination and gender-

related wage differentials. The underlying characteristics that explain wage differentials will be examined in an attempt to determine whether women's lower wages result in part from the characteristics of the organizations in which they are employed. Importance of work in this area lies in investigating which institutional variables exert the main influences on wages, how they operate, and how their effects can be separated to discover the true nature of the relationship.

The specific contributions this study seeks to make include:

1) an examination of the factors influencing wages for men and women;

2) an examination of the factors contributing to a wage differential between men and women;

3) an examination of the role of ability to pay wages and willingness to pay wages in contributing to wage differentials;

4) an examination of the role of ability to pay and willingness to pay in wage determination and gender-related wage differentials for the particular case of the public sector.

SIGNIFICANCE OF STUDY

The significance of this study lies in two interrelated areas. First, the significance lies in the

examination of the role of ability to pay wages in the development of wages and wage differential theory. This will be acomplished through an investigation of why ability and willingness to pay theoretically should be determinants of wages, and whether or not they are important empirically. Second, the significance lies in the examination of factors contributing to gender-related wage differentials. While many scholars have offered explanations for the existence of the gender-related differential, none have completely explained it and few have considered the role of ability to pay and institutional characteristics in the differential (Hodson and England, 1986).

Theoretically, the significance of the study lies in its contribution to the development of a theory of wage differentials and the specific case of gender-related wage differentials through an attempt to define the characteristics of organizations that contribute to wage differentials. Because of the level of analysis and data utilized, this study offers a more direct test of the theory of wage determination and wage differentials than past studies.

It is also of theoretical significance to attempt a better specification of the variables that determine the ability to pay wages. Poor variable specification may be one reason that previous empirical work has provided mixed

support for the theoretical model which proposes that ability to pay wages is the primary constraint in the actual determination of wages (Mahoney, 1979). The challenge of this study therefore, is to define the variables that differentiate firms with respect to their ability to pay and determine whether, and to what extent, these differences influence gender-related wage differentials.

It is also of significance to conduct the study in the public sector. The unique opportunity provided in the public sector for the examination of wage determination and interpretation of gender-related wage differentials at the organizational level will offer potential significance to the development of the theory of wage determination and wage differentials (Borjas, 1980). Although the study is conducted in the public sector, the relationships discussed and the findings will not be limited to the public sector. The theoretical dimensions of wage determination that will be discussed in the study concerning the role of ability to pay, the internal labor market and organizational characteristics in wage determination can be applied to public sector wage determination as well. The study is grounded in the theory of wage determination which applies to both the public and private sector. The same relationships that are found to exist in this particular public sector sample are therefore expected to apply to the

private sector.

The application of theoretical principles of wage determination to the public sector is appropriate since public sector organizations are subject to supply and demand forces in the labor market just like other organizations (Freund, 1974). They too must compete for workers in the labor market and must pay wages comparable to competitors if they want to retain employees (Freund, 1974). Public sector organizations also possess characteristics similar to private sector organizations and often adhere to the principles of the internal labor market in their promotion and compensation practices (Borjas, 1983). Although their resources are not termed "profits", public sector organizations depend on those resources to pay wages. The aspects of wage theory that will be addressed in this study include the influence of resources on wage payments and not where the resources come from.

Therefore, since public sector organizations are subject to economic forces in the labor market, since they are buyers of labor services, and since they have to compete with other organizations to retain employees, the theory of wage determination applies in the public sector as well as the private sector. The theoretical principles discussed and conclusions reached through a public sector study should also be expected to translate to the private sector (Freund, 1974). The public sector can thus provide

a good model to study interfirm differences in wages which will aid understanding of wage differences in the private sector (Borjas, 1983).

Conducting the study in the public sector will also be of significance due to the availability of inter-organizational data and ease of operationalization of variables. The accessability of establishment level data will correct for problems encountered in past work of lack of available data and the use of aggregated data. The problem of factors influencing wage differentials is one that should be studied at the organizational level since the organization is where wage decisions are made. A public sector study allows for empirical testing of the model of wage determination with inclusion of as many relevant variables as possible (Gordon et al., 1974). The public sector offers a "well-defined labor market" where many sources of heterogenity have been removed. This makes it possible to see more clearly any patterns of discrimination that may exist (Johnson and Stafford, 1974).

There have been few establishment level wage studies in the private sector, however. Those studies that have been conducted have typically omitted organizational level characteristics such as size, and organizational measures of ability and willingness to pay (Borjas, 1983). Many private sector studies therefore, have not adequately modelled the wage determination process because of a lack

of available data and lack of focus on the employer. These problems will be corrected through a public sector study at the organizational level.

This study also has potential practical significance by explaining the differential in terms of organizational characteristics of organizations. Showing that gender-related wage differentials are related to the characteristics of organizations and their differential ability to pay wages will provide an alternative to the belief that the differential is due to intentional or unintentional discrimination on the part of employers and lessen the impact of the comparable worth argument. What appears to be wage discrimination might actually be differential financial capability of the organizations in which women are employed (Hodson and England, 1986). Finding that gender-related wage differentials are due to women's employment in organizations with lower ability to pay offers the longer run solution of moving those women into the higher paying organizations, perhaps through the enforcement of aggressive equal employment opportunity and affirmative action programs, as opposed to the expensive plan of job re-evaluation proposed by advocates of comparable worth. The issue therefore, is one of employment opportunity rather than one of pay discrimination.

SUMMARY

Although many studies have attempted to account for gender-related wage differentials, the differential has never been fully explained and persists with little indication of decreasing. While studies have traditionally focused on individual and occupational level explanations for the differential, this study will focus on characteristics of organizations that may lead to a gender-related wage differential and the role of ability to pay in wage determination and gender-related wage differentials. The specific research questions that will be addressed in the study include:

1) What factors explain wage differentials across organizations?;

2) What role does ability to pay have in determining wage levels across organizations?;

3) Do those factors that contribute to wage differences explain differences in both men's and women's average wages across organizations?;

4) Can the process by which gender-related wage differentials arise across organizations be identified?

Chapter II reviews research literature relevant to the proposed study. Topics covered include a discussion of the theoretical foundations of wages, a summary of the human capital and occupational segregation theories of wage differentials, a review of studies examining the role of

ability to pay in wage determination, and factors contributing to gender-related wage differentials across organizations. The conceptual models and hypotheses will also be described in Chapter II. Chapter III includes the development of the operational models and hypotheses and the research methodology to be employed. Chapter IV presents the descriptive statistics of the sample and results of tests of operational hypotheses of each of the models of average wages and the model of gender-related wage differentials. Chapter V provides a discussion of results, conclusions, and suggestions for future research.

CHAPTER II

LITERATURE REVIEW

INTRODUCTION

Literature relevant to the proposed study will be reviewed in this chapter. The theoretical foundations of wage determination and wage differentials will first be examined. Next, the arguments for the human capital and occupational segregation explanations for gender-related wage differentials will be summarized. Then, the findings concerning the influence of ability to pay on wage determination will be presented. Finally the findings of studies that have examined gender-related wage differentials across organizations will be discussed.

THEORETICAL FOUNDATIONS OF WAGE DETERMINATION

Economic theories of wage payments have evolved over time in their examination of factors that contribute to overall wage levels from Ricardo's Subsistence Theory to Mills' Wage Fund Theory. The Subsistence Theory explained wage levels to be a function of long-run labor supply. The Wage Fund Theory developed the idea that in addition to labor supply influences, employer's decisions concerning contributions to the wage fund influenced the wage level. While the Subsistence Theory was purely a supply-side theory of wage determination, the Wage Fund Theory

introduced the idea that employer's demand considerations could also play a role in wage determination (Rothschild, 1967).

The theory of wages was further developed with the introduction of Marginal Revenue Productivity Theory. Marginal Revenue Productivity Theory was a demand-side theory which said that wages were determined by demand conditions with the supply of labor taken as given. This theory assumes that: 1) labor is homogenous; 2) employers will hire workers up to the point where their marginal product equals their marginal cost, and that the marginal product of labor declines as more workers are hired because of the law of diminishing marginal proportions; and 3) there is a close relationship between a worker's productivity and the wages the person receives for that work (Rosenbaum, 1980).

ABILITY TO PAY

Marginal Revenue Productivity theory says that if an employer wants to maximize his profit, his demand for labor should equal the marginal revenue productivity of labor. Marginal revenue product is the amount added to total output by the last worker hired times the price of that output, in other words, the additional revenue an employer receives by employing an additional unit of labor. Marginal revenue product reflects productivity and product

market or demand elasticity influences (Mahoney, 1979). The intersection between average and marginal revenue productivity will determine the number of workers desired to maximize profit at various market wage rates. The wage fund available to pay wages is determined by the average net revenue, or net revenue after profit. This average net revenue product of labor represents the "maximum profitable average cost of labor or wage level", or ability to pay high wages (Mahoney, 1979:119). Because it represents the maximum profitable wage level for the organization, ability to pay is the major economic constraint on wages.

The ability to pay constraint is especially important to employers who are competitors within a product market. If employers within a product market possess similar technology and demand elasticities, average net revenue product, or ability to pay, would tend to be the same within that product market. Conversely, if production costs, scale of production, and other factors differ, then ability to pay and wage levels will also differ within the product market. It is likely that organizations will vary in their ability to pay wages (Hills and Hughes, 1977). Differences in ability to pay accounts for why firms might be relatively high or low wage employers within a product market.

Although ability to pay is the most important constraint on wages, there are other factors that enter

into the decision of what the actual wage level will be. Theoretically, an organization could have high ability to pay but a low willingness to pay. Organizations may have a high ability to pay wages but choose not to pay high wages. According to the Wage Fund Theory, the employer's decisions concerning contributions to the wage fund influence wage levels. If the market wage rate is less than the wage rate dictated by the ability to pay constraint, the employer has some flexibility in determining where to set actual wage rates. The employer may decide to put the excess money available for wages above the labor market rates into alternative investments. Willingness to pay therefore, is also an important consideration in the actual determination of wages across organizations.

Ability to pay is a major constraint on wages in both the private and public sector. In the public sector, ability to pay may be determined by factors not directly related to the production or sale of the product as it is in the private sector. Ability to pay could be determined in part through budgetary and political processes. The presence of a budgetary process which determines some of the resources that contribute to an organization's ability to pay is why a product market in the public sector may possess similar characteristics, but organizations in that market could possess different abilities to pay. The public sector therefore, offers an appropriate test of 1)

differences in ability to pay within an industry, and 2) the effect of those differences on wage levels since ability to pay is the "ultimate budget constraint" on organizations (Easton, 1988).

Thus, the theories of wage determination discussed above provide a way for firms to analyze their ability to pay wages and suggest that different cost structures and labor productivities among firms will result in differences in ability to pay. Wage level differences between organizations therefore, can be explained by ability to pay differences. This study will be examining within product market differences in ability to pay to determine whether differences in ability to pay across organizations influence wage differences between those organizations.

INTERNAL LABOR MARKETS

The theory of internal labor markets also offers an explanation of factors that are important in wage determination across organizations. Internal labor market theory proposes that workers enter an organization through the port of entry position which is usually a lower or even the lowest entry-level position. Workers then advance internally to higher positions within the organization (Doeringer, 1967). Wage determination for positions in the organization differs for these port of entry positions and higher positions in the organization. Wages at the port of

entry position are determined by the external labor market. Organizations have little discretion in wage setting at this level. As the individual moves up into higher level jobs in the organization, the organization has more discretion in wage determination and becomes more insulated from wage rates in the external labor market (Hills, 1987). Wages become more a function of institutional policies (Doeringer, 1967), resulting in more variance in within occupation wages across organizations at higher level positions than at entry level positions.

The concepts of internal labor market theory will be tested in this study through an analysis of wages at three position levels of an organization, the port of entry level and two subsequent higher levels. It is believed that wages will be similar across organizations for the entry level positions since wages are determined in the external labor market. Firms have little discretion in wage determination for entry level jobs if they wish to be competitive. At the upper levels, there will be more variance in wages since wages are more a function of organization policies and characteristics. It is believed that ability to pay will have a greater influence on wages at the upper job levels of organizations since the organization has more discretion to exercise ability to pay at these levels.

THEORETICAL FOUNDATIONS OF WAGE DIFFERENTIALS

Economists have attempted to explain the general nature of wage differentials since before the time that Adam Smith first hypothesized factors that would lead to wage differentials. Many empirical examinations of wage differentials have questioned the usefulness of Marginal Revenue Productivity theory in the actual practice of wage determination and argued that other factors enter into wage determination. Specifically, critics of Marginal Revenue Productivity believe that: 1) labor is not homogenous; and 2) earnings do not reflect workers' marginal productivity. Researchers have found situations occurring where workers were equal in terms of their productivity, but were not paid equal wages, which contradicted Marginal Revenue Productivity theory.

Gottschalk (1978) for example, found discrepancies between workers' payments and their productivities in that workers earnings did not reflect their productivity. In an attempt to resolve such discrepancies with Marginal Revenue Productivity theory, a theory which was an extension of the work of Adam Smith was developed. This theory, known as the human capital model, allowed for differences in productivity of labor based on differences in investment by individuals in factors that would make them more productive such as education and training. In the human capital model, an individual's investment

decisions are the basic factors which lead to heterogeneity of labor, which in turn results in wage differentials (Stevenson, 1984). The theoretical rationale of the human capital model became the basis for the earliest explanations of gender-related wage differentials as well.

Others, in the analysis of wage differentials, have retained the assumptions of Marginal Revenue Productivity theory and have tested its theoretical proposition that differentials occur because of structural differences in the characteristics of the economic environment in which workers are employed (Stevenson, 1984). For instance, one aspect of wage differentials which has been examined at some length is the union non-union differential. In modeling the union non-union wage differential, studies have implicitly assumed homogeneity of labor and ignored differences in worker quality. Instead, studies focus on the institutional effects of the industrial environment on wage differentials and examine the impact of variables such as the bargaining power of the union or the industry's concentration ratio on wage differences. Thus, wage differentials were theorized to be a function of the economic environment (Stevenson, 1984).

ORGANIZATIONAL CHARACTERISTICS AND WAGE DIFFERENTIALS

Empirical studies that have investigated the role of institutional characteristics in wage determination have

shown that differences in certain characteristics explain wage differences across organizations. The organizational characteristics that have been hypothesized to be significantly related to wage rates include the presence of unions, size of establishment, growth, and geographic location. Findings of these studies of the influence of organizational characteristics on wage differentials across organizations will be discussed below.

Unionization

The studies that have examined the role of unionization in wage determination generally theorize that unions will have a positive impact on wages for a number of reasons. Unions can bargain for high wages with less danger of adverse effects (Masters, 1969), and unions are more likely to arise in high-wage industries with high ability to pay (Kahn, 1980). Studies examining the effect of unionization on wages have generally found a positive effect (Hodson, 1983). Masters (1969) found a positive significant effect of unions on wages of manufacturing workers as did Kwoka (1983). In many studies, industry data was utilized because of the belief that a union wage effect had traditionally been industry-wide, and because of easier availability of data. Some researchers believe however, that the "establishment" is the more correct unit of analysis since it is in the organization that wage decisions are made (Hodson, 1983). Conducting this study

within one industry will examine whether unionization has an intraindustry effect on wages in addition to the inter-industry effect shown in past studies.

Size

Another organizational characteristic that has been shown to have a positive impact on wages is size of establishment. Masters (1969), Kwoka (1983) and Pugel (1980) found a significant positive effect of size on wages. Bailey and Schwenk (1980) found that establishment size, as measured by the number of employees, was positively significantly related to occupational wages within industries. Explanations given for this relationship include the idea that larger establishments possess economies of scale which result in greater productivity and higher profits which are passed on to workers. Personick and Barsky (1982) found a positive significant relationship between size and pay levels across establishments for workers within an occupation holding constant for industry variation. Even though this study included a dummy variable as a control for industry, this like other studies of the influence of size, was conducted across industries. It remains to be seen whether the effect of size will remain when specifically tested within one industry.

Growth

Hodson (1983) examined the role of organizational

growth on wage determination. He hypothesized that growth would have a positive impact on wages because organizational growth would result in an increased demand for labor. Organizations would then have to pay inflated prices to attract that labor in the competitive market. He found that growth did explain a significant amount of the variance in wages across firms and industries. However, the effect of organizational growth on wages within an industry has not yet been tested empirically.

Geographic Location

Studies have examined the influence of an organization's geographic location on wage determination. Variables that have been hypothesized to influence wage differences across geographic location include geographic region and area population. Landon (1970) found a positive relationship between city size as measured through population and wage rates in one occupation. Baldwin and Daski (1976) included measures of population and geographic region to determine the effect of geographic location on wages. They measured geographic location with dummy variables for the four geographic regions of Northeast, South, North Central and West. They found a positive effect of population on wage levels and significantly higher wages outside of the South region. Barsky (1981) also found a significant positive relationship between pay and city size within selected occupations. In a study of

public sector teacher salaries, Antos and Rosen (1974) found that geographic differences in school location explained a "substantial portion" of wage variation across schools. The present study will test whether geographic location influences wages within one industry and occupation.

Summary

Most studies examining the role of organizational characteristics on wage levels have done so looking across occupations and across industries. Some have conducted the analysis within occupational groupings with industry as a control variable. None however, has measured the effect of unionization, size, geography, or growth at the organizational level within an industry. By examining wage levels within an industry, this study will investigate whether establishment level characteristics have an influence on wages independent of industry. If not, then the effect of these variables on wages may be more due to the overall characteristics of the industry rather than specific forces operating at the organizational level. These studies discussed above have examined the relationship in the private sector. Through the present study, it will be seen whether an organizational influence exists in the public sector as well.

GENDER-RELATED WAGE DIFFERENTIALS

Past studies of gender-related wage differentials in both the private and public sector have generally attempted to account for the differential by examining differences in characteristics of individual workers - the human capital studies, and differences in characteristics of jobs - the occupational segregation studies. Human capital explanations for the differential propose that women earn less than men because they have a lower stock of human capital which makes them less valuable in the labor market. Occupational segregation theory proposes that women earn less than men because they are employed in occupations that pay less. The general findings of the human capital and occupational segregation studies will be summarized below in order to provide an overall review of past work on gender-related wage differentials.

HUMAN CAPITAL DIFFERENCES

Economic analyses of gender-related wage differentials have generally been based on theories of differences in the characteristics of individual workers, following the human capital or rate of return on investment approach. Human capital theory estimates the importance of personal factors in explaining gender-related wage differentials. Human capital theory is a supply side theory which proposes that wage differences are a function of investment variables

endogenous to the individual - over which the individual has control. Thus, individuals choose their level of investment and are paid accordingly.

The basic assumption of human capital theory is that an increased stock of human capital results in increased productivity for the worker which in turn results in higher wages. Since it is difficult to directly measure this increased productivity, it is measured through factors that are believed to lead to increased productivity including education and work experience. Thus, explanations for wage differentials are found in differences in attainment of human capital attributes, such as education level, training, and experience which are used as indicators of human capital investments. The general procedure for analyzing the male-female wage differential in human capital studies is to estimate what earnings of men and women would be if they received equal returns for human capital so that the only differences in earnings occur because of differences in the amount of human capital possessed (Treiman and Hartmann, 1981).

Thus, human capital theory says that pay is a return to employees for their investment in schooling, training, experience and other factors that make them more valuable to employers. Pay then, is an outcome based on the individual input of employees. Human capital studies however, tend to neglect the fact that even after

controlling for differences in employee input, variances in wages exist between employers and industries. In fact, "worker characteristics account for very little of the difference in earnings," and most of that difference is due to women receiving a lower return on human capital variables than men (Treiman and Hartmann, 1981:56).

In the study being conducted here, showing that a greater proportion of women are employed by organizations that can only afford to pay lower wages could explain why women receive a lower return for their stock of human capital since the sample will be homogeneous with respect to human capital differences that could influence the gender-related wage differential.

OCCUPATIONAL SEGREGATION

The second common explanation for the earnings gap between men and women is occupational segregation, which attributes the gap to differences in the distribution of men and women across different jobs. There is disagreement as to how the occupational segregation occurs. A supply side theory would hold that women choose certain occupations by weighing the expected returns from entering the occupation with the costs of entry, such as training, dislike of a particular kind of job, or working conditions. A demand side theory on the other hand, would hold that women's lack of entry into more rewarding male-dominated

jobs cannot be attributed solely to their tastes and preferences, but instead, that women are forced into certain occupations because of the discriminatory hiring, placement and promotion practices of employers and institutional factors which segregate them from certain occupations (Treiman and Hartmann, 1981). According to economic theory of supply and demand, the crowding of women into relatively few occupations, whether through their vlountary choice or because of limited access to other occupations, would lower their wages due to the increased supply of women compared to the demand for labor in these female-dominated occupations. Thus, while there is debate as to whether occupational segregation is a supply or demand side phenomenon, it does exist. It is commonly accepted that men and women hold different kinds of jobs. The segregation of men and women into various occupations is a serious problem for women because of the consequences it brings for women. One outcome of the segregation is that women are concentrated in relatively low-paying occupations. The more an occupation is dominated by women, the less it pays (Blau and Ferber, 1986). Men, on the average, dominate occupations that are more desirable in terms of their pecuniary rewards (Beller, 1982). Occupational segregation is also a problem because occupations that were predominately female in 1960 have remained so. Women have made "only minimal" gains in

entering predominately male occupations (Meyer and Maes, 1983:115). According to the theory of occupational segregation thereore, the male-female wage differential comes about because of the types of jobs held by men and women, and can be explained by the concentration of women in low-paying occupations (Shack-Marquez, 1984).

Studies have also shown that gender-related earnings differentials also occur within an occupation. Firms differ in their propensity to employ women and their levels of occupational sex segregation. Mellor (1984) found that women earned less in almost all occupations of census classification across industries. Mellor's study however, like many occupational segregation studies both between occupations and within an occupation was conducted across industries. Studying one occupation within one industry as will be done in the current study, controls for the many sources of variance in findings that occur when using inter-industry data.

ORGANIZATIONS AND GENDER-RELATED WAGE DIFFERENTIALS

It has been established above that women are distributed differently across occupations than men and earn less in these occupations. It has also been found that even within an occupation men earn more than women (Bergmann, 1974). A study by Buckley (1979) found that the gender-related earnings differential decreased when women

were employed in firms where jobs were sexually integrated. In firms that employed men and women, there was an inverse relationship between the percentage of women employed in the firm and earnings for women and men (Stevenson, 1984). Thus, institutional factors may play a larger role in creating the differential than can the actual occupations themselves.

In an establishment level study across industries, Sieling (1984) found that an individual level gender-related wage differential did exist within establishments, but it was smaller than the gender-related differential by occupation across all establishments. Finding a larger between organization rather than within organization gender-related wage differential would be expected if establishment level characteristics such as ability to pay are important determinants of wages across organizations. The existence of larger across organization wage differences than within organization differences will also be tested in the present study.

Blau (1977) found that even when occupations were integrated by sex, wage differentials remained across firms. She attributed the differentials to the belief that a wage hierarchy exists among firms and that women are segregated into low paying firms. Blau investigated the existence of a wage hierarchy in the private sector and found that structural factors (such as ability to pay in

this study) influenced a firm's relative standing in that hierarchy. She also found that the factors that were positively associated with the relative wage standing of a firm (as high ability to pay would be here) were negatively associated with the proportion of women in the firm.

Blau's study was conducted within broad occupational catagories across organizations rather than within specific occupations. The structural factors contributing to the development of a hierarchy examined in the study included size of establishment, union status and industry. She maintained that the development of a gender-related wage differential that could be attributed to establishment level characteristics would be hard to determine. This could be due to the confounds present in her study created by examining only broad occupational groups where individual differences that could contribute to gender-related wage differences could be introduced, and to the confounds created by examining occupations across industries, since industry could be mediating the effect of the establishment level characteristics.

In her model, size, unionization and industry were control variables operationalized as dummy variables. She stated that none of these variables was well-distributed across her sample so that it was not possible for her to estimate the "pure effect" of these variables on wages. Thus, she categorized her study as a "preliminary

investigation" into the importance of organizational factors in the ranking of the firm in a wage hierarchy and in the representation of women in the firms.

Summary

While occupational segregation studies have shown that gender-related wage differentials occur because of women's segregation into lower-paying occupations, it has also been shown that women earn less within occupations (Meyers and Maes, 1983). Human capital studies attribute within occupation gender-related wage differentials to differences in individual characteristics. Others however, have suggested that gender-related wage differentials within occupations may be more influenced by characteristics of the organization which make them less able to pay high wages. If women are segregated into these low paying organizations, then the differential can be attributed to the characteristics of the organizations and their lower ability to pay wages rather than to individual level differences or occupational differences.

This study offers the opportunity for a more conclusive test of the hypothesis that gender-related wage differentials are due to organizational differences in ability to pay since the study will be conducted within an occupation and industry. Conducting the study within one industry removes the confounds of past studies of using data across occupations and industries and controls for

those possible sources of variance in wages. Also, while studies have suggested that women's segregation into the low end of a between firm wage hierarchy can explain gender-related wage differentials, no one has examined all the factors that contribute to that hierarchy or explained the process by which the hierarchy contributes to gender-related differentials. The study being conducted here will attempt to do both by examining the role of ability to pay, organizational characteristics, and the internal labor market on wages.

ABILITY TO PAY AND PUBLIC SECTOR WAGE DETERMINATION

Public sector wage determination has been the focus of renewed interest by researchers in the past twenty years, partly due to the fact that public sector employment has increased considerably and partly due to a interest in comparing public to private sector wage determination processes looking for similarities and differences in the procedures and outcomes (Easton, 1988). Researchers have examined the roles of ability to pay and willingness to pay in the wage determination process because of the theoretical importance of ability and willingness to pay in setting the limits of what a firm is able to and will actually pay in wages. These studies have analyzed the impact of ability to pay on wage differences across organizations, and not gender-related wage differentials.

The role of ability to pay on wage determination has been less studied in the private sector. Brown et al. (1985) attributed the lack of emphasis on ability to pay as a determinant of wages in private sector studies to the difficulty of obtaining data disaggregated below industry level. Studies have also examined the relationship between ability to pay and wages more frequently in the public sector because data can be examined within catagories of the public sector such as cities or universities, which would correspond to a within industry study in the private sector. In this way, within industry variation in ability to pay can be analyzed.

Studies have produced mixed results as to the role of ability to pay in public sector wage determination. The findings of those studies show that ability to pay was predictive of wages for some organizations but not others, or only for certain groups of workers. In a study of the effect of competition on the salaries of entry-level public school teachers at the elementary and secondary levels, Landon and Baird (1971) found that willingness to pay was a significant predictor of salary in only one school district tested. Ability to pay variables were significant in some but not all school districts.

Schmenner (1973) studied the effects of unionization on the wages of municipal workers and found that ability to pay measures explained a small part of public sector wages.

In a study of the effects of unions on the wages of municipal employees, Ehrenberg and Goldstein (1975) found no consistent relationship between ability to pay measures and municipal wages. Some ability to pay variables were significantly related to wages, but only for certain catagories of workers.

Weber (1980) utilized five measures of ability to pay in a study of the influence of public sector bargaining on the wages of city workers. He found that ability to pay variables explained very little of the variation in pay levels across cities for the various catagories of workers tested and only one, city tax rate, was statistically significant for one group of city workers. Matthews and Holmes (1982) conducted a study of regional revenue potential and its influence on beginning teacher salaries and found that salary was influenced by the ability to generate revenue.

In a study examining the determinants of average salary levels for elementary and secondary public school teachers in Florida, Ward and Fackender (1987) found that assessed valuation and education level of the population as measures of ability to pay were positively correlated with average teacher salary. In a study examining the impact of collective bargaining on public school teacher salaries, Easton (1988) found that neither ability to pay or willingness to pay had an influence on salaries. This

study, like the other studies examining the role of ability to pay on wages, was conducted across local labor and product markets; thus, the studies included no controls for supply or demand side variables which could also influence wages across region or employer. The present study will control for the influence of the labor and product market on wages by conducting the study within one product and labor market.

Ability to Pay and University Wage Determination

One study has specifically examined the role of ability to pay in wages at the university level. Hills and Hughes (1977) examined the reasons for geographic differentials in university faculty salaries and hypothesized that differences in ability and willingness to pay would account for salary differences across geographic regions. State per capita income was used as the measure of ability to pay, and state per capita tax rate was used to measure willingness to pay. They found that both ability and willingness to pay were significant determinants of salaries at the upper faculty ranks. Ability to pay was not a significant determinant of salary at the assistant professor rank.

The study attributed the lack of significance of ability to pay at the assistant professor level to the theoretical constructs of the internal labor market such

that at this entry-level position, schools were 'price takers' and had to pay going market rates in order to attract faculty so that ability to pay and institutional factors had less influence. At upper level positions however, organizations were more insulated from the forces of the competitive market and the internal labor market of the organization was a greater factor in wage determination. Because of the working of the internal labor market therefore, ability to pay had a greater influence on wages across organizations at the upper level positions. That study will attempt to replicate that finding.

GENDER-RELATED DIFFERENTIALS IN UNIVERSITY SALARIES

As in the private sector, a wage differential between men and women has been documented in the public sector over the past twenty years that continues to exist even with women's increasing entry into and participation in public sector employment (Bergmann, 1986). Studies of gender-related wage differentials both within and across universities have found that a differential exists in the salaries of male and female university faculties even after accounting for differences in credentials and experience, leading to the belief that sexual discrimination is "common" in academics and is due to "sex bias" (Bergmann, 1986).

Studies, while reporting the existing differential, have failed to offer compelling legitimate reasons for its existence. Most studies attribute the differential to human capital differences since most studies have been conducted within a university using individual level data for their analysis. Studies generally utilize a multiple regression methodology and regress salary as the dependent variable with gender as an independent variable. If gender is a significant predictor of salary after accounting for other factors, then a differential is said to exist.

Some studies of gender-related salary differentials have also been conducted across universities. LaSorte (1971) compared salary and rank of faculty across universities. He found a significant differential at each rank and found that the differential increased with rank. Factors included to explain the differential were age, highest degree, experience, academic field, and geographic region. All factors explained some of the differential, but a significant portion remained. Explanations offered for the existence of the differential were that women predominated in lower-paying institutions and smaller institutions; however, his data did not support either of these explanations. He found that women did hold positions in predominantly male institutions and the salaries at smaller schools were comparable to larger ones.

While this study did not support the idea that women

are segregated into lower-paying organizations, there were aspects of this study that possibly confounded the results which will be corrected in the present study. LaSorte included in his sample faculty from all institutions including public and private schools and colleges and universities. This means that occupation was not constant since faculty jobs have different responsibilities across teaching v. research institutions. There were also no measures of institutional characteristics that could contribute to the between firm hierarchy and no measures of ability to pay. His finding that the size of the gender-related wage differential increased with rank will be tested here. In this study, however, the focus will be on the size of the differential across organizations. According to the theory of internal labor markets, it would be expected that the differential would increase with rank across organizations since organizations have more discretion in the setting of wages at higher job levels.

Johnson and Stafford (1974) hypothesized that labor force participation differences between male and female faculty would explain much of the gender-related wage differential. They found that part of the differential is explained by the fact that women tended to be employed at institutions which offer less training and less opportunity for skill improvement. They believed that women voluntarily chose to work in schools with less opportunity

for interaction with distinguished colleagues because the schools offered higher initial salaries. While the more prestigious schools offered opportunity for accumulation of human capital that would increase earnings over time, women were more interested in short term salary gain because they planned to leave the labor market during child-bearing years. Women would also be less able to obtain jobs at the more prestigious institutions when they returned to the labor market because they did not have the accumulated skills. The authors hypothesized that women would have incentives to work hard to obtain these skills and more readily compete with their male counterparts after re-entering the labor force. Over time, therefore, the differential should be expected to be small initially, widen over a woman's childbearing years, then decrease after those years. They concluded that the differential arises because of women's voluntary choices in the labor market.

This study attributed the gender-related wage differential to individual level characteristics because it was conducted at the individual level with human capital variables as explanatory factors. The study also included faculty across all types of institutions and did not test separate equations of salary by rank, as will be done in the current study to control for individual differences that could influence salary across rank.

In an individual-level study of earnings of Ph.D. holders across universities, Ferber and Kordick (1978) held that discrimination against women was a major source of gender-related differential in earnings. In a regression with salary as the dependent variable and independent variables that included the human capital variables age, year of degree, books and articles published, and grants obtained, academic field, and gender, gender had a significant negative impact on salary. Unlike Johnson and Stafford, they did not find that more women were employed more frequently by the lower ranking, higher paying schools, and therefore disagreed with Johnson and Stafford's intermittency hypothesis. The study reports the findings of the data but offers few compelling reasons for the lower pay of women. Thus, the study was not guided by theory in its explanations for the differential. The study was also not limited to faculty, but included all university personnel, so that it was an across occupation study; and like the previous studies, this study did not control for type of institution.

In a study of the effect of the proportion of women on salaries across university administrators, Pfeffer and Davis-Blake (1987) predicted that economic competition, group power, group interaction and institutional factors including geographic region, size, type of institution, and resources or ability to pay would influence male and female

salaries. They hypothesized that a negative relation between the percentage female at a university and salaries might not be due to employer discrimination but to the fact that a school with less resources, and therefore lower ability to pay, would have to hire more workers willing to work for low wages and those workers were women. Ability to pay was measured as the number of full time enrolled students per faculty and the percentage of full time staff and faculty to the school's budget. They found that size, region, and resources all had a significant impact on salaries. They also found a negative relation between the percentage of women and salaries. They attributed this to crowding acting to depress salaries and to institutional factors which define certain jobs as women's and pay less because of it.

The Pfeffer and Davis-Blake study offered a test of the theory of a wage hierarchy between firms, the importance of ability to pay in creating the hierarchy, and the position of women in the hierarchy which had not been done before since all of the past studies examined were conducted with individual level data and thus had as their main purpose explaining individual level gender-related wage differentials. The study was conducted within one occupation of university administrators. The study sample was not completely homogeneous however, since the researchers stated that different policies could influence

wage decisions for different types of administrators. Although the study stated that the institutions were similar, the study was not conducted within one product market. Both public and private schools were used, as were both colleges and universities. Dummy variables were used as controls for these differences. The present study will, therefore, offer a stricter test of the wage hierarchy and female segregation across the hierarchy since it will be conducted with a more specific sample using organizational level data. If the same relationships exist with this sample of faculty, then their findings can be generalized beyond university administrators.

CONCEPTUAL MODELS

The overall conceptual model that will be used as the basis of the study proposes that ability and willingness to pay and institutional factors influence wages across organizations. Models will be specified separately for average wages, average male wages, average female wages and gender-related wage differentials across organizations for each job level to control for influences on wages that occur across job levels. The conceptual hypotheses that will be tested in the model will also be presented.

A Test for Segregation

Past studies across occupations have shown that

percentage female in the firm and job have a negative effect on wages (Hodson, 1986). Based on those findings from the gender-related wage differential literature discussed earlier and Blau's (1977) finding of a negative relationship between the proportion of women in a firm and the firm's position in a wage hierarchy, it would be expected that a negative relationship between average wages and percentage of women would exist in this study. No studies have, however, examined the influence of within occupation segregation in one industry on wage levels as will be done in the present study. In order to establish whether there is segregation of women into low wage organizations, the relationship between average wages and the percentage of women in the organization will be examined. If a negative relationship between percentage female and average wage does exist, then the study will attempt to explain the relationship by introducing legitimate factors which explain the wage differences. The presence of segregation will be tested by the following hypothesis:

CH(S)(1a): Percentage female will be negatively associated with average wage of the organization at each job level.

The existence of a negative relationship between percentage of women and wages will also be tested

separately in the models of average wages of men and average wages of women. It is expected that the same relationship that appears with average wages in general will also occur for the average wages of men and women if the same factors are influencing the wages of both. The hypotheses will test whether there is a negative effect on men's wages of having more women employed at the organization and whether having more women at the organization lowers the average wage of women compared to organizations with less women employed. This leads to the following conceptual hypotheses:

CH(S)(1b): Percentage female will be negatively associated with average male wage of the organization at each job level.

CH(S)(1c): Percentage female will be negatively associated with average female wage of the organization at each job level.

A MODEL OF AVERAGE WAGE DETERMINATION

The conceptual model used to explain average wages across organizations addresses the research questions: 1) What factors explain wage differentials across organizations?; and, 2) What role does ability to pay have in determining wage levels across organizations? The model

proposes that differences in average wages across organizations occur because of differences in ability to pay, willingness to pay, institutional factors including the organization's size, whether there is a union present, organizational growth, geographic location, market factors, and any residual.

The model of the determinants of wage levels at the organization will be tested at each of the three job levels used in the study. Models at each job level can then be compared to each other to determine if they are equally predictive in terms of variance in average wages explained at each job level, and to determine if the same variables explain average wages at each job level.

The importance of each of the above variables to wage determination and reason for its inclusion in the model will be discussed below.

Ability to Pay

One purpose of this study involves developing a better understanding of the role of ability to pay on the wage determination process and the wage differential between men and women. Wage differences between employers are theoretically conceptualized to be a function of differences in ability to pay (Mahoney, 1979). As discussed earlier, ability to pay is the fund of money available to pay wages and as such, should have importance in the actual determination of wages since it is the

constraint employers must follow in setting wages (Mahoney, 1979). As evidenced by results of studies discussed earlier, while important to theory, empirical studies have produced mixed results when considering whether ability to pay is an important component in wage determination. This leads to the following conceptual hypothesis:

CH(A)(1): There will be a positive association between average wage and ability to pay when controlling for other independent variables.

$$\bar{W} = f(\text{Ability to Pay})$$

Willingness to Pay

Since organizations could have a high ability to pay but choose not to pay high wages, willingness to pay must also be considered in a model of wage determination (Hills and Hughes, 1977). This leads to the following conceptual hypothesis:

CH(A)(2): There will be a positive association between average wage and willingness to pay when controlling for other independent variables.

$$\bar{W} = f(\text{Willingness to Pay})$$

Organizational Characteristics

There are certain characteristics of organizations which could exert an independent effect on wages and contribute to wage differentials across organizations that will be examined in the model. They are explained as follows:

Size: A positive relation between size and wages has generally been shown to exist in the private sector. Whether the same type of relationship exists in the public sector will be determined by the inclusion of the size variable. In the private sector, size is expected to have a positive impact on wages for many reasons. First, larger firms are more likely than small firms to use long-term planning which can result in greater stability in production and demand for their product, so they would have greater resources in terms of revenue relative to costs to pay higher wages (Rexroat and Shenan, 1986). Large establishments also tend to possess greater economics of scale, thus higher productivity through more refined division of labor and efficient management. These factors would tend to result in greater ability to pay which could be passed on to workers. It is also believed that larger establishments will pay higher wages to compensate for the rigidity and impersonality associated with large size establishments, or will pay more to project a certain image

or reputation (Buckley, 1979). Whether these relationships translate to the public sector will be seen in this study. This leads to the following conceptual hypothesis:

CH(A)(3): There will be a positive association between average wage and the size of the organization when controlling for other independent variables.

$$\bar{W} = f(\text{Size})$$

Unionization: Unionization could be expected to have a positive impact on wages because of the bargaining power of unions to negotiate with less danger of adverse effects. Unions representing public sector employees have had an impact on wages. Their political lobbying and appealing to the public to gain broad-based support for their wage increases has been effective in helping to increase public sector employee's wages relative to private sector wages (Fogel and Lewin, 1974). Ehrenberg and Goldstein (1974) found a five to fifteen percent union differential for wages of municipal workers. Whether this positive effect of unions on wages holds for university faculty will be tested here. On the other hand, there may be an inverse relation between the presence of a union and wages. Unions may have organized at organizations with poor wages to try and improve those wages. This leads to the

following conceptual hypothesis:

CH(A)(4): There will be a positive association between average wage and the presence of a union when controlling for other independent variables.

$$\bar{W} = f(\text{Unionization})$$

Growth

Institutional growth brings opportunities for new positions at an organization. As demand for the product grows, so too must the employment increase to support that growth. For that reason, growth is expected to have a positive impact on wages. With greater sales comes greater production and increased demand for labor. This will result in higher wage payments to attract this labor (Hodson, 1983). This leads to the following conceptual hypothesis:

CH(A)(5): There will be a positive association between average wage and the growth rate of an organization when controlling for other independent variables.

$$\bar{W} = f(\text{Growth})$$

Geographic Location

It has been suggested that the geographic location of an organization affects its wages. The many reasons for this relationship include differing abilities of cities to attract workers, population differences which increase cost of products, services and taxes. Thus, there is regional bias in wages that must be controlled for (Haworth and Reuther, 1978). This leads to the following conceptual hypothesis:

CH(A)(6): There will be an association between average wage and geographic location when controlling for other independent variables.

$$\bar{W} = f(\text{Geographic Location})$$

Academic Mix: For reasons that are the topic of continuing investigations, it has been found that men and women enter different kinds of jobs in the organization which could lead to gender-related wage differentials. Traditionally, women have been underrepresented in professional programs which tend to pay higher wages due to market conditions. Market demands for certain occupational specializations could increase wages in areas such as engineering, computer science, medicine, law and business. For the public sector in general and public sector universities in particular, competing with the private sector for faculty in these

male-dominated areas could give an upward bias to the average wage at a university. This leads to the following conceptual hypothesis:

CH(A)(7): There will be a positive association between average wage and academic mix when controlling for other independent variables.

$$\bar{W} = f(\text{Academic Mix})$$

Percentage Female

As discussed earlier, researchers have hypothesized that a hierarchy of firms exists with respect to wages and that high-wage firms exclude women from hiring, so that between firm earnings differentials are related to the sexual composition of the workforce (Blau, 1977). The concept of a wage hierarchy is being tested in this study to determine what effect a wage hierarchy of firms might have on wage differentials across organizations. The model will investigate how the average wage of the organization is related to the gender composition of the organization. It is expected that there will not be an effect of the percentage of women in an organization on average wages of that organization after controlling for the influence of ability to pay, willingness to pay, and organizational characteristics (Bohlander, 1980). The lack of an effect

after allowing for the effects of theoretically important explanatory variables would imply that organizations do not pay low wages because there are more women at the organization, but because they have a low ability to pay and can only afford to pay low wages (Milkovich, 1980). This leads to the following conceptual hypotheses:

CH(A)(8): After controlling for the influence of ability to pay, willingness to pay and organizational characteristics, there will be no significant relationship between average wage and percentage female.

$$\bar{W} = f(\text{Percentage Female})$$

Internal Labor Market

According to the theoretical construct of internal labor markets, organizations would be price takers for employees at entry level positions in the organization (Hills and Hughes, 1977). At upper levels however, organizations would have more discretion in wage determination and wages would be determined by internal factors including ability to pay, willingness to pay and organizational characteristics. If the internal labor market concept is operating across organizations then upper level positions would be more insulated from external labor market forces and there would be more variance in wages

across organizations at these upper levels (Hills and Hughes, 1977). The model of wage determination developed above has shown how ability to pay is expected to influence wages, but if the internal labor market process is operating in organizations, then ability to pay would be less explanatory at the entry level job than at higher level jobs. Ability to pay therefore, would be a good predictor of upper level wages across organizations even though it may be a poor predictor of wage levels at the entry level jobs. The relationship between ability to pay and the internal labor market necessitates testing the model of wage determination with ability to pay and willingness to pay measures separately at each job level. Doing so will show the impact of the external and internal labor market on wages. This leads to the following conceptual hypotheses:

CH(A)(9): Ability to pay and willingness to pay will be more predictive of wages at upper job levels than at the entry level.

CH(A)(10): There will be more variation in average wages between organizations of differing ability to pay at the upper job levels than at the lower level.

Summary

The conceptual relationship between wages and each of the variables discussed above can be represented in the following conceptual model:

$$\bar{W} = f(\text{Ability to Pay, Willingness to Pay, Size, Unionization, Growth, Geographic Location, Academic Mix, Percentage Female, Residual})$$

MODEL OF AVERAGE MALE WAGES

The model used to explain the wages of men across organizations addresses the research question: Do those factors that contribute to wage differences explain differences in average male wages across organizations. The model proposes to explain why differences occur in the average wage of men across organizations. The model is the same that is used to explain average wages in general as described above. All organizational level variables included in the general model should also be expected to explain men's wage levels. Percentage female is included to test whether a negative relationship between percentage of women and men's average wages exists after including the influence of ability to pay and organizational characteristics on wages. Individual level human capital variables should not contribute to wage differences across organizations since the model will be tested at each rank to control for human capital influences on wage across

rank. Thus, this model can be described as:

$$\bar{W}_{male} = f(\text{Ability to Pay, Willingness to Pay, Size, Unionization, Growth, Geographic Location, Academix Mix, Percentage Female, Residual})$$

This model leads to the following conceptual hypotheses:

CH(M)(1): There will be a positive association between average male wage and ability to pay when controlling for other independent variables.

$$\bar{W}_{male} = f(\text{Ability to Pay})$$

CH(M)(2): There will be a positive association between average male wage and willingness to pay when controlling for other independent variables.

$$\bar{W}_{male} = f(\text{Willingness to Pay})$$

CH(M)(3): There will be a positive association between average male wage and the size of the organization when controlling for other independent variables.

$$\bar{W}_{male} = f(\text{Size})$$

CH(M)(4): There will be a positive association between average male wage and the presence of a union when

controlling for other independent variables.

$$\bar{W}_{male} = f(\text{Unionization})$$

CH(M)(5): There will be a positive association between average male wage and the growth rate of an organization when controlling for other independent variables.

$$\bar{W}_{male} = f(\text{Growth})$$

CH(M)(6): There will be an association between average male wage and geographic location when controlling for other independent variables.

$$\bar{W}_{male} = f(\text{Geographic Location})$$

CH(M)(7): There will be a positive association between average male wage and academic mix when controlling for other independent variables.

$$\bar{W}_{male} = f(\text{Academic Mix})$$

CH(M)(8): After controlling for the influence of ability to pay, willingness to pay and organizational characteristics, there will be no significant relationship between average male wage and percentage female.

$\bar{W}_{male} = f(\text{Percentage Female})$

Internal Labor Market

The relationship between ability to pay and the internal labor market discussed in the model of average salary determination is expected to hold in the sub-group analysis of men's wages. The following hypotheses will test the relationship for average male wages:

CH(M)(9): Ability to pay and willingness to pay will be more predictive of male wages at upper job levels than at the entry level.

CH(M)(10): There will be more variation in average male wages between organizations of differing ability to pay at the upper job levels than at the entry level.

A MODEL OF FEMALE AVERAGE WAGES

The model used to explain wages of women addresses the research questions: 1) Do those factors that contribute to wage differences explain differences in women's average wages across organizations?; and 2) Are the variables that explain men's wages equally predictive of women's wages? The model proposes to explain why average wages of women at

one organization differ from their average wages at another organization, and if the same characteristics of organizations that explain average male wages also explain average female wages. Because of this, the same model used to explain male wages is used here. If the same characteristics do not explain wage levles of women then different variables may be impacting on women's wages. By having the same models for male and female wages, it will also be possible to compare how a organization's ability and willingness to pay influence both male and female wages. If it is found that organizations with high ability to pay actually pay high wages to men but not to women, then there may be evidence of discrimination against women. Thus, the model can be specified as follows:

$$\bar{W}_{female} = f(\text{Ability to Pay, Willingness to Pay, Size, Unionization, Growth, Geographic Location, Academic Mix, Percentage Female, Residual})$$

This model leads to the following conceptual hypotheses:

CH(F)(1): There will be a positive association between average female wage and ability to pay when controlling for other independent variables.

$$\bar{W}_{female} = f(\text{Ability to Pay})$$

CH(F)(2): There will be a positive association between

average female wage and willingness to pay when controlling for other independent variables.

$$\bar{W}_{female} = f(\text{Willingness to Pay})$$

CH(F)(3): There will be a positive association between average female wage and the size of the organization when controlling for other independent variables.

$$\bar{W}_{female} = f(\text{Size})$$

CH(F)(4): There will be a positive association between average female wage and the presence of a union when controlling for other independent variables.

$$\bar{W}_{female} = f(\text{Unionization})$$

CH(F)(5): There will be a positive association between average female wage and the growth rate of an organization when controlling for other independent variables.

$$\bar{W}_{female} = f(\text{Growth})$$

CH(F)(6): There will be an association between average female wage and geographic location when controlling for other independent variables.

$\bar{W}_{female} = f(Geography)$

CH(F)(7): There will be a positive association between average female wage and academic mix when controlling for other independent variables.

$\bar{W}_{female} = f(Academic\ Mix)$

CH(F)(8): After controlling for the influence of ability to pay, willingness to pay and organizational characteristics, there will be no significant relationship between average female wage and percentage female.

$\bar{W}_{female} = f(Percentage\ Female)$

Internal Labor Market

The relationship between ability to pay and the internal labor market discussed in the model of average salary determination is also expected to hold in the sub-group analysis of female wages. The following hypotheses will test the relationship for female average wages:

CH(F)(9): Ability to pay and willingness to pay will be more predictive of female wages at upper job levels than at the entry job level.

CH(F)(10): There will be more variation in average female wages between organizations of differing ability to pay at the upper job levels than at the lower level.

A Comparison of Male and Female Models of Wage Determination

In order to answer the second research question posed in the model of average female wages, (Are the variables that explain male wages equally predictive of female wages?), it is necessary to compare the results of the male and female equations in terms of the variance in average wages explained by each model and the effect of the independent variables on average wages in each model. This leads to the following conceptual hypotheses:

CH(C)(1): The male and female models of average wages will be equally predictive of wage levels.

CH(C)(2): Variables which are predictive of wages in the male model of average wages will also be predictive of wages in the female model of average wages.

A MODEL OF GENDER-RELATED WAGE DIFFERENTIALS

The model used in this study to explain gender-related

wage differentials addresses the research question: Can the process by which gender-related wage differentials arise across organizations be identified? The model seeks to determine the factors that contribute to the lower wages of women across organizations. While the study controls for individual level human capital characteristics and occupational level differences that could influence gender-related wage differentials, it does not focus on the human capital or occupational segregation explanations for the differential as has been done in the past. Instead, the study examines the role of ability to pay and internal labor market processes in influencing gender-related wage differentials across organizations.

Segregation

In order to examine the process by which gender-related wage differentials arise across organizations, the change in percentage of women at the organization between the present and the earliest year for which data is available will be determined for each job level at every organization. It is expected that the percentage of women will increase, but that the increase will be smaller in high ability to pay organizations. The increase in percentage of women will be compared across high and low ability to pay organizations to determine whether segmentation of women into low ability to pay organizations

is occurring. The model of the gender-related wage differential will thus examine if segmentation is occurring structurally, but the question of why it occurs cannot be determined. This leads to the following conceptual relationships and hypothesis:

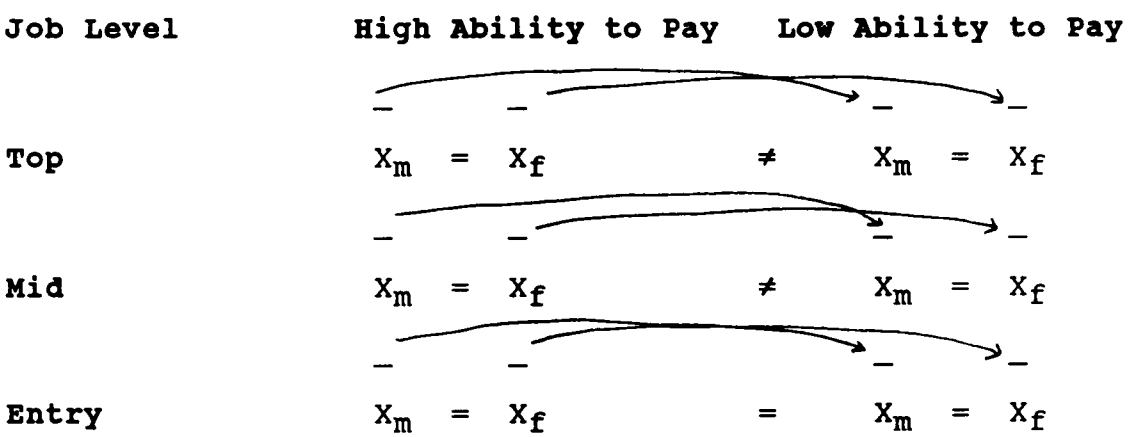
Job Level	**High Ability to Pay**	**Low Ability to Pay**
Top	Increase in %Female	<Increase in %Female
Mid	Increase in %Female	<Increase in %Female
Entry	Increase in %Female	<Increase in %Female

CH(D)(1): The increase in percentage of women employed over the past ten years is smaller in higher ability to pay than lower ability to pay organizations at each job level.

The Process by Which Gender-Related Differentials Arise

Results of the tests of the model of wage determination across organizations will show whether or not ability and willingness to pay are good predictors of actual wages across organizations at each job level. Then, the process by which gender-related wage differentials arise across organizations can be investigated. It is hypothesized that a gender-related wage differential develops due to the existence of a wage hierarchy and the working of the internal labor market in the following way. According to internal labor market theory, ability to pay

should predict wages at upper level positions in the organization. According to the model of wage determination, it is expected that there is a wage hierarchy and women predominate in organizations at the low end of the wage hierarchy. If women remain at those lower paying organizations as they are promoted to higher levels, the gender-related wage differential would be due to the fact that a larger percentage of women enter lower paying organizations than men and subsequently earn less than men because those organizations can only afford to pay lower wages. The gender-related wage differential is therefore due to the fact that women are more frequently employed by organizations with lower ability to pay. This leads to the following conceptual relationships and hypotheses:



CH(D)(2a): There will be no difference between average male and average female wages within high ability to pay organizations at each job level.

CH(D)(2b): There will be no difference between average male and average female wages within low ability to pay organizations at each job level.

CH(D)(3a): There will be no difference between average male wages across high and low ability to pay organizations at the entry job level.

CH(D)(3b): There will be no difference between average female wages across high and low ability to pay organizations at the entry job level.

CH(D)(4a): There will be a difference between average male wages across high and low ability to pay organizations at the upper job levels.

CH(D)(4b): There will be a difference between average female wages across high and low ability to pay organizations at the upper job levels.

SUMMARY

When examining the literature on gender-related wage differentials, there seems to be considerable debate as to the causes of the differential. Explanations have been

offered at: 1) the individual level; 2) the occupational level; and, 3) the organizational level. Individual level explanations attribute the differential to differences in the accumulation and presence of human capital which makes workers differentially valuable and results in pay differences. Occupational level explanations attribute the differential to the segregation and consequent crowding of women into lower-paying occupations. Organizational level explanations attribute the differential to characteristics of the organization.

A review of the theory of wage differentials and empirical studies examining both overall wage differences and gender-related wage differentials suggests the following conclusions:

1) Ability to pay is a theoretically important determinant of wages across industries. It remains to be seen through the models developed by this study whether ability to pay will also be an important determinant of wages within an industry.

2) Occupational segregation by gender exists both across and within industries. This study will investigate whether segregation exists within an occupation and within an industry as well.

3) Researchers have investigated the existence of a between organization wage hierarchy and have found that women are segregated into firms at the low end of the

hierarchy. No one has fully examined the factors that contribute to the development of the hierarchy or examined the process by which women's segregation into low wage firms explains gender-related wage differentials. Examining the determinants of the wage hierarchy and the process by which women's segregation in the hierarchy leads to gender-related wage differentials will be the focus of the models developed in this study.

The overall model of wage determination developed in this chapter proposes that wages are a function of ability to pay, willingness to pay, organizational characteristics, and the percentage of women employed. It is hypothesized that ability to pay, willingness to pay, and organizational characteristics will all have a significant effect on wages. It is further hypothesized that the percentage of women will be negatively associated with average wage, but that there will not be a relationship between percentage female and wages after the influence of ability to pay, willingness to pay and organizational factors are accounted for. The models of male and female average wages propose that both men's and women's wages are determined by the same factors that explain average wages in general and that the same relationships proposed in the general model will exist for men's and women's wages. The model of the gender-related wage differential proposes that differences in men's average wage across organizations and women's

average wage across organizations can be explained by differences in ability to pay, willingness to pay and organizational characteristics across organizations.

Through testing of the models developed in the study, the study will examine whether women are concentrated in low wage organizations and whether the wages of these organizations are determined by ability to pay, willingness to pay, organizational characteristics, and the working of the internal labor market. If those relationships are found to exist, then it could be concluded that gender-related wage differentials across organizations are due to ability to pay differences across organizations. It is hypothesized that while there is some differential between men and women's wages within an organization, the gender-related differential is larger across organizations. The study will thus attempt to determine whether women are skewed in their employment opportunities and resulting wage outcomes even in a highly controlled study examining one occupation in the same industry.

Chapter 3 will develop the operational models that will be used in the study to test the relationship between ability to pay and wage determination and the gender-related wage differential, and discuss the methodology to be utilized in testing the models.

CHAPTER III

METHODOLOGY

INTRODUCTION

The purpose of this study is to develop conceptually and test empirically models which attempt to explain differences in average wages and the gender-related wage differential across organizations. The study will examine the role of ability to pay in the determination of wages and in gender-related wage differentials by examining, 1) average salaries for university professors at each of the ranks of assistant, associate and full professors; 2) average salaries separately for male and female professors; and, 3) the average salary differential between male and female professors. By doing so, the study will seek to answer the following research questions:

1) What factors explain wage differentials across organizations?

2) What role does ability to pay have in determining wages across organizations?

3) Do those factors that contribute to wage differentials explain differences in both male and female average wages across organizations? In other words, are the variables that explain male wages equally predictive of female wages?

4) Can the process by which gender-related wage differentials arise across organizations be identified?

By specifying and testing models for overall average wage determination, average wages of men and women, and gender-related wage differentials, the study will investigate what factors influence overall wage levels, as well as the wages of men and women. The study will also investigate whether gender-related wage differentials exist and if so are the result of differences between organizations in ability to pay, organizational characteristics, or any unexplained difference that could be attributed to discrimination.

In the following sections, the chapter will discuss the methodology to be employed in the study, providing an explanation of the operational models to be utilized, operational hypotheses that follow from the models, variable measures and statistical analyses.

RESEARCH SETTING

The study will be conducted across public, doctoral level universities. There are numerous reasons for selecting the present study setting. Conducting the study in the public sector provides a sample of organizations with variable measures that are comparable across organizations so as to avoid making inaccurate comparisons on the important explanatory factors across firms (Hills and Hughes, 1977).

Public universities are a good choice for the public

sector industry for many reasons. First of all, universities are relatively homogenous in terms of the types of services offered, skill requirements for employment, types of jobs, and employment conditions (Landon, 1970). Secondly, despite the increasing participation rate of women in university faculties, a differential in the salaries of men and women faculty continues to exist (Bergmann, 1986). For example, the College and University Personal Association reported an average 37% differential between male and female salaries across universities in 1987. (Creal et al., 1988). Finally, universities provide a good example of an industry which may desire to attract more women and may demonstrate that desire to hire more women by paying higher salaries.

The sample of institutions used in the study includes public sector doctoral granting institutions that reported information to the United States Department of Education Center for Education Statistics through its Higher Education General Information Survey (HEGIS). The HEGIS series collects salary, financial, and enrollment information on a universe of institutions whose accreditation is recognized by the Department of Education (Center of Education Statistics, 1988). From a possible universe of 219 doctoral level institutions, information was obtained for 162 HEGIS respondants in the 1985-86 survey year.

From these respondants, inspection of residuals in the regression analyses indicated that some possible outlyers might exist in the data. The residuals for two of the observations, Texas Women's University and the University of Alaska, were especially large, about 75% higher in absolute value than the next highest error terms. Outlyers cannot be arbitrarily discarded however, since they may provide relevant information about the relationships being tested (Maddala, 1977). A "safe rule" is to discard them only if there is direct evidence that they represent an error in recording, or if they can be shown to be from a different population (Barnett and Lewis, 1984). That is because it is necessary for valid statistical inference that all observations be part of the same sampling universe and be generated by the same structures. It could be argued that the two observations above do indeed come from a different sampling universe and should be removed from the sample. Texas Women's University was the only single-sex school in the sample, the rest were co-educational. The school also had extremely high numbers of women faculty at each rank, larger than any other school. It could be argued that the school had a different mission than the rest of the schools, which was reflected in their educating and hiring of women.

The University of Alaska could also be argued to be from a different structure because of a much higher cost of

living compared to other states. The school had the largest salary levels and highest values for ability to pay variables of all of the schools. The high levels seem to indicate inflationay standards in Alaska not comparable to the rest of the country. Regardless of this rationale, it was necessary to test the intuitive belief that these schools were outlyers. This was done through a test of discordancy for outlyers using the maximum absolute studentized residuals estimated from regression equations. The studentized residual values for the two schools above exceeded the critical values for significance at the 5% level, suggesting they were outlyers. No other residual values were significant. The outlyers were therefore removed, resulting in a sample of 160 universities with usable responses.

Demographic data for the sample indicates that schools had an average enrollment of 13,901 full-time students, with an average of 53% men and 47% women. Schools had an average of 592 total faculty, with an average of 81% men and 19% women. This compares to a national average of 73% men and 27% women across two, four-year and graduate institutions in the United States (Aisenberg and Harrington, 1988) and 24% women in a 1985 study of masters and doctoral granting institutions by Oklahoma State University. There were no all-male or all-female institutions included in the sample. Additional

characteristics of the sample relevant to variables in the models are reported in Chapter IV.

CONTROLS, ASSUMPTIONS, and LIMITATIONS

The models developed in the present study will examine between organization differences in wages by evaluating wage data from doctoral level, public universities. Public universities, as defined by the Center for Education Statistics of the United States Departmant of Education, include all institutions under the control of, or affiliated with, Federal, State or local agencies. Doctoral level institutions include institutions that award doctoral degrees (Center for Education Statistics, 1988). Because they are doctoral granting institutions, these schools are unique from the other types of institutions and as a sample, more homogenous with respect to their missions. These schools generally focus on research as well as teaching, and require the Ph.D. as a minimum entry requirement for tenure-track faculty positions.

Only doctoral granting schools are included to hold constant other factors that could influence salaries across the different types of institutions. These factors include differences in educational requirements for faculty that might result in individual level salary differentials, and differences in institutional characteristics such as an emphasis on teaching v. research that could influence wage

determination at the organizational level.

Choosing only doctoral granting institutions for the sample also controls for wage differentials that could be due to labor market differences. The market for highly skilled labor is generally national in scope (Hills and Hughes, 1977). Since doctoral level schools generally require a Ph.D. as an entry-level requirement, those schools would be most likely to recruit nationally for labor. Use of doctoral granting schools therefore, also results in a fairly homogeneous labor market and controls for differences in labor market conditions that could influence wages across organizations (Schmenner, 1973).

The study controls for human capital differences that could influence gender-related wage differentials at the individual level and factors that influence the differential at the occupational level. Occupational control is accomplished through the examination of salaries separately at each rank. Typical human capital differences that could influence wages at the individual level such as age and experience are also controlled for by the examination of wages at each rank. There would be a great deal of restriction on an age variable within rank since the faculty profession is one that is not entered until later in life, after completion of years of educational study. Education is also restricted since the entry-level requirement for tenure-track faculty in doctoral level

institutions used in the sample is generally the Ph.D. degree.

The study does not however, include any personal characteristics of workers that might also influence individual-level wages. The study assumes that workers possess similar skills in order to attain each job level, and that while differences between workers at the same job level may exist, they would be small (Blau, 1977). Individuals therefore are expected to be fairly homogenous in terms of their stock of human capital, and individual differences are expected to have a small impact on wages across organizations. The largest portion of wage differences across organizations are thus expected to be attributed to factors other than individual differences (Blau, 1977).

If it is not the case that age, experience, and other human capital variables are homogenous, then they might have an impact on individual wages within an organization. Not including individual level data in that case would be a limitation of the study. It must be remembered however, that the present study is an across-organization study of wages utilizing organizational level variables, not a within-organization study of individual level data. The study also does not consider the internal pay system of each organization. The study assumes that differences across organizations would be random occurances and would

not have a systematic effect on wages. If that is not the case, then it is a limitation of the study not to include individual variations in pay systems.

In assessing each organization's ability to pay, the study does not take into account the effect of different state government and university governing structures that could influence appropriation and budgeting decisions. The study assumes that any differences would not systematically effect the results. While it is recognized that variables such as the ones discussed above are important, it is assumed that they have a random effect on wage determination across organizations. The study has attempted to include well-constructed measures for important explanatory variables within the constraints of appropriateness to the models and data availability.

Since the study will utilize secondary data in order to test the proposed models and hypotheses, measurement quality is a possible limitation that must be considered. The secondary data used for salary, some ability and willingness to pay measures, and some measures of organizational charactersitics are self-reported by each university. While there is potential error in using self-reported responses, all of the information used is reported through standardized forms filled out by the universities. Information on what should or should not be included in the calculation of each variable is clearly specified on each

of the forms (Center for Education Statistics, 1988). One check on the reliability of the salary data used in the study was a comparison of that data with data from another public source. As discussed, salary data will be obtained from the Center for Education Statistics HEGIS salary survey. Salary data is also available from the annual survey of the American Association of University Professors. A comparison of salary figures from the two sources showed a one to one correspondance between the two sources which indicates that institutions used the same data to complete both reports for the separate surveys.

Information for all other variable measures used in the study, including the state tax and income data that are also used to measure ability to pay and willingness to pay, will be collected from independent sources not self-reported by the universities. The operational measures of the variables are argued to be valid in that they are clearly defined, adequately reported, and represent the theoretical constructs being tested. Reliability will be improved and the possibility of measurement error reduced through careful coding of the variables, a verification of the coding of each observation and a check for any data inconsistencies. Information on the specific definition and source of each variable will be discussed following the development of the operational models below.

OPERATIONAL MODELS

The conceptual models developed in Chapter II will be presented in their operational forms below. The first model to be discussed is the overall model of average wages at each job level. Next, the sub-group models of average wages of men and average wages of women will be explained. Then, the model of gender-related wage differentials will be discussed.

In the models that will be specified below, wages are hypothesized to be a function of ability to pay, willingness to pay and organizational characteristics. This is the case because the profitability of an organization in the private sector and the level of funding available in the public sector determines its ability to pay. The more profitable the organization and the more funding available, the more it can afford to pay wages; in other words, the greater its ability to pay.

It is an important focus of this study to model average wages and gender-related wage differences as a result of differences in ability and willingness to pay. As seen by examining studies of wage determination, empirical work has resulted in a mixed role for ability to pay in wage determination and little conclusive evidence of the role of ability to pay in gender-related wage differentials. Since much of this confusion may be the result of different specifications of ability and

willingness to pay, an important component of this study will be the specification of the ability and willingness to pay variables. It is expected that ability and willingness to pay will explain a significant amount of the variance in wages across organizations.

The research questions being addressed in this study concern the factors influencing wage determination, male and female average wages, the gender-related wage differential across organizations, and the relationship between ability to pay and both wages and gender-related wage differentials. The study seeks to examine whether ability and willingness to pay exert independent effects on wages and contribute to explaining gender-related wage differentials across organizations.

Models will be specified separately for average wages, average male wages, average female wages and gender-related wage differentials across universities. Models will be tested separately at each rank of full, associate and assistant professor to control for influences on wages that occur across job levels.

The examination of salaries by rank will also illustrate the working of the internal labor market. As discussed earlier, the internal labor market is connected to the external labor market at the port of entry positions. Theoretically, wages at the port of entry depend greatly on the wages of competitors; however, at

higher level positions, the organization has more flexibility in wage determination. The major entry port for universities is the assistant professor rank. After this, promotion is usually from within the organization (Reagan and Maynard, 1974).

The general equations for the operational models and the operational hypotheses following from each model will be presented below.

Test for Segregation Hypotheses

OH(S)(1a): There will be a significant ($p < .05$) negative relationship between percentage female and average wage at each job level.

OH(S)(1b): There will be a significant ($p < .05$) negative relationship between percentage female and average male wage at each job level.

OH(S)(1c): There will be a significant ($p < .05$) negative relationship between percentage female and average female wage at each job level.

A MODEL OF AVERAGE WAGE DETERMINATION

The general equation for the operational model of wage determination is:

$$\bar{W} = a + b(\text{Ability to Pay}) + b(\text{Willingness to Pay}) + b(\text{Size}) + b(\text{Unionization}) + b(\text{Growth}) + b(\text{Geographic Location}) + b(\text{Academic Mix}) - b(\text{Percentage Female}) + \text{Residual}$$

The specification of the conceptual model discussed earlier suggests the following operational hypotheses:

OH(A)(1): There will be a significant positive ($p < .05$) relationship between average wage and ability to pay when controlling for other independent variables.

OH(A)(2): There will be a significant positive ($p < .05$) relationship between average wage and willingness to pay when controlling for other independent variables.

OH(A)(3): There will be a significant positive ($p < .05$) relationship between average wage and size when controlling for other independent variables.

OH(A)(4): There will be a significant ($p < .05$) positive relationship between average wage and unionization when controlling for other independent variables.

OH(A)(5): There will be a significant positive ($p < .05$) relationship between average wage and growth when

controlling for other independent variables.

OH(A)(6): There will be an significant ($p < .05$) relationship between average wage and geographic location when controlling for other independent variables.

OH(A)(7): There will be a significant positive ($p < .05$) relationship between average wage and academic mix when controlling for other independent variables.

OH(A)(8): There will not be a significant ($p < .05$) negative relationship between percentage female and average wage when ability to pay, willingness to pay and organizational characteristics are controlled for.

Internal Labor Market Hypotheses

OH(A)(9): Ability to pay and willingness to pay will be more predictive of wages at the full than associate level and at the associate than assistant level.

OH(A)(10): Variance in average wage across organizations will increase from assistant to associate and from associate to full professor level.

Statistical Procedures

Simple regression analysis with average salary as the

dependent variable and percentage female as the independent variable will be used to test operational hypotheses of segregation: OH(S)(1a), OH(S)(1b), and OH(S)(1c). Multiple regression analysis will be used to test all operational hypotheses of the determinants of average wages in the model, OH(A)(1) through OH(A)(8). Type III Sums of Squares will be utilized to determine whether a given independent variable has an effect on the dependent variable after other variables are accounted for. The dependent variable for the multiple regression analysis is average faculty salary at the school. The independent variables include ability to pay, willingness to pay, size, unionization, growth, geographic location, academic mix and percentage female. The .05 level of significance is chosen for all hypotheses as the level at which the hypothesis will be accepted or rejected. The model will be tested separately at each job level of full, associate, and assistant professor rank.

The four measures of ability to pay will be combined into a composite variable, and the composite will then be used in each of the wage models tested. A composite variable can be formed in order to obtain a more efficient measure of the construct where there are multiple measures of the construct and each measures a different aspect of the construct (Ghiselli et al., 1981). Since the variables are measured in different units, they are noncomparable in

their present form. To correct for this, scores will be standardized by transforming them into a z distribution of scores. The composite measure of ability to pay will then be formed by combining the standardized scores of each component.

In order to combine the scores and form the composite, regressions will be run using the general model of wage determination with average wage at the university as the dependent variable and only including measures of ability to pay as independent variables. This will establish the relationship between average wage and each ability to pay measure (Wonnacott and Wonnacott, 1979). The stepwise MAXR technique will be used to eliminate non-significant ability to pay variables from the equation since they are not making a significant contribution to the explanatory power of the model (Cohen and Cohen, 1983). Only variables that are significant at the .05 level or below will be included in the composite. While there are limitations to using stepwise regression, the MAXR technique is superior to all other stepwise techniques since it uses pair-wise comparisons to eliminate variables that do not make significant contributions to the overall R^2 (Spector and Goodnight, 1985).

The significant ability to pay components will then be weighted according to the standardized beta coefficients of the ability to pay variables. The betas reflect the

relative importance of each ability to pay variable to average wage (Pindyck and Rubinfeld, 1981). The weighted components will then be summed to form the composite. A composite will also be formed in the same way from the three measures of willingness to pay.

The hypotheses concerning the internal labor market will also be tested. OH(A)(9) will be tested by using a reduced regression at each rank with only ability to pay and willingness to pay included as independent variables. A comparison of R^2 values across ranks tested with an F-test will show whether equations are differentially predictive of average wages across ranks and will show in which equation the total variation in wages explained by ability to pay is the largest (Pindyck and Rubinfeld, 1981). OH(A)(10) will be tested with an F-test to determine whether the variances in average wages are equal across equations (Mendenhall et al., 1977).

A MODEL OF AVERAGE MALE WAGES

The general equation for the operational model of average male wages:

$$\bar{W}_{male} = a + b(\text{Ability to Pay}) + b(\text{Willingness to Pay}) + b(\text{Size}) + b(\text{Unionization}) + b(\text{Growth}) + b(\text{Geographic Location}) + b(\text{Academic Mix}) - b(\text{Percentage Female}) + \text{Residual}$$

The specification of the conceptual model discussed earlier suggests the following operational hypotheses:

OH(M)(1): There will be a significant positive ($p < .05$) relationship between average male wage and ability to pay when controlling for other independent variables.

OH(M)(2): There will be a significant positive ($p < .05$) relationship between average male wage and willingness to pay when controlling for other independent variables.

OH(M)(3): There will be a significant positive ($p < .05$) relationship between average male wage and size when controlling for other independent variables.

OH(M)(4): There will be a significant ($p < .05$) positive relationship between average male wage and unionization when controlling for other independent variables.

OH(M)(5): There will be a significant positive ($p < .05$) relationship between average male wage and growth when controlling for other independent variables.

OH(M)(6): There will be a significant ($p < .05$) relationship between average male wage and geographic

location when controlling for other independent variables.

OH(M)(7): There will be a significant positive ($p < .05$) relationship between average male wage and academic mix when controlling for other independent variables.

OH(M)(8): There will not be a significant ($p < .05$) negative relationship between percentage female and average male wage when ability to pay and organizational characteristics are controlled for.

Internal Labor Market Hypotheses

OH(M)(9): Ability to pay and willingness to pay will be more predictive of male wages at the full than associate level and at the associate than assistant level.

OH(M)(10): Variance in average male wages across organizations will increase from assistant to associate and from associate to full professor level.

Statistical Procedures

Multiple regression analysis will be used to test all operational hypotheses in the model of average male wages, OH(M)(1) through OH(M)(8). The dependent variable is average male faculty salary in the organization. The

independent variables include ability to pay, willingness to pay, size, unionization, growth, geographic location, academic mix, and percentage female. The hypotheses concerning the internal labor market, OH(M)(9) and OH(M)(10) will be tested in the same way that they were for the general model of average wages.

MODEL OF AVERAGE FEMALE WAGES

The general equation for the operational model of average female wage determination is:

$$\bar{W}_{female} = a + b(\text{Ability to Pay}) + b(\text{Willingness to Pay}) + b(\text{Size}) + b(\text{Unionization}) + b(\text{Growth}) + b(\text{Geographic Location}) + b(\text{Academic Mix}) - b(\text{Percentage Female}) + \text{Residual}$$

The specification of the conceptual model discussed earlier suggests the following operational hypotheses:

OH(F)(1): There will be a significant ($p < .05$) positive relationship between average female wage and ability to pay when controlling for other independent variables.

OH(F)(2): There will be a significant ($p < .05$) positive relationship between average female wage and willingness to

pay when controlling for other independent variables.

OH(F)(3): There will be a significant positive ($p < .05$) relationship between average female wage and size when controlling for other independent variables.

OH(F)(4): There will be a significant ($p < .05$) positive relationship between average female wage and unionization when controlling for other independent variables.

OH(F)(5): There will be a significant positive ($p < .05$) relationship between average female wage and growth when controlling for other independent variables.

OH(F)(6): There will be a significant ($p < .05$) relationship between average female wage and geographic location when controlling for other independent variables.

OH(F)(7): There will be a significant positive ($p < .05$) relationship between average female wage and academic mix when controlling for other independent variables.

OH(F)(8): There will not be a significant ($p < .05$) negative relationship between percentage female and average female wage when ability to pay and organizational characteristics are controlled for.

Internal Labor Market Hypotheses

OH(F)(9): Ability to pay and willingness to pay will be more predictive of female wages at the full than associate level and at the associate than assistant level.

OH(F)(10): Variance in average female wages across organizations will increase from assistant to associate and from associate to full professor level.

Comparison of Male and Female Models Hypotheses:

OH(C)(1): The male and female models of average wages will be equally predictive of wages.

OH(C)(2): Independent variables which are predictive of wages in the male model of average wages will be equally predictive of wages in the female model.

Statistical Procedures

Multiple regression analysis will again be used to test all operational hypotheses in the model of average female wages, OH(F)(1) through OH(F)(8) as in the previous models. The dependent variable is average female faculty salary in the organization. The independent variables include ability to pay, willingness to pay, size,

unionization, growth, geographic location, academic mix, and percentage female. The hypotheses concerning the internal labor market, OH(F)(9) and OH(F)(10) will be tested in the same way that they were for the general model of average wages.

OH(C)(1) and OH(C)(2) will be tested through F tests of the full v. the restricted models of average wages at each job level. According to this test, significant differences between men's and women's wage equations as indicated by the F value, would imply that the male and female sub-groups are not equivalant, that the coefficients are not equal across the male and female equations, and that women are treated differently from men in wage determination (Pindyck and Rubinfeld, 1981).

A MODEL OF GENDER-RELATED WAGE DIFFERENTIALS

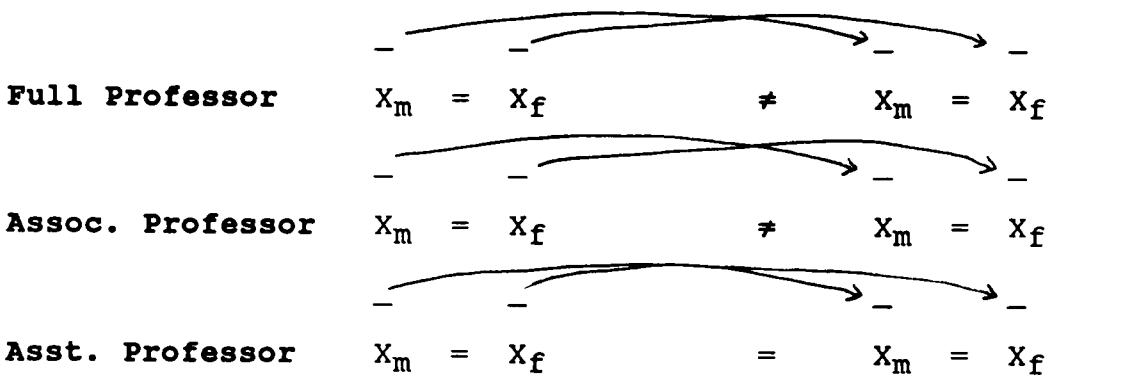
The specification of the conceptual model discussed earlier suggests the following operational relationships and hypotheses:

Segregation

Rank	**High Ability to Pay**	**Low Ability to Pay**
Full Professor	Increase in %Female <	Increase in %Female
Assoc. Professor	Increase in %Female <	Increase in %Female
Asst. Professor	Increase in %Female <	Increase in %Female

OH(D)(1): The increase in percentage female is significantly less ($p < .05$) in higher ability to pay than lower ability to pay organizations at each rank.

The Process by Which Gender-Related Differentials Arise



OH(D)(2a): There will be no significant ($p < .05$) difference between average male and average female wages within high ability to pay organizations at each rank.

OH(D)(2b): There will be no significant ($p < .05$) difference between average male and average female wages within low ability to pay organizations at each rank.

OH(D)(3a): There will be no significant ($p < .05$) difference between average male wages across high and low ability to pay organizations at the assistant professor rank.

OH(D)(3b): There will be no significant ($p < .05$) difference between average female wages across high and low ability to pay organizations at the assistant professor rank.

OH(D)(4a): There will be a significant ($p < .05$) difference between average male wage across high and low ability to pay organizations at the associate and full professor ranks.

OH(D)(4b): There will be a significant ($p < .05$) difference between average female wage across high and low ability to pay organizations at the associate and full professor ranks.

Statistical Procedures

The composite measure of ability to pay developed earlier will be used in order to divide organizations into either a high or low ability to pay category. Schools will then be categorized as high or low ability to pay schools based on whether they fall above or below the median on the composite ability to pay measure. The median was chosen as the point at which to divide universities because it is the value at which half of the composite ability to pay measures will be higher and half will be lower. It is a

more reliable measure than the mean since it minimizes the effect of very high or low salaries (Creal et al., 1988).

OH(D)(1) will be tested through the use of a t-test for the model at each job level comparing the increase in percentage female across high and low ability to pay schools to see if there is a significant difference between the two and to determine which mean is larger.

A two-way analysis of variance with ability to pay and gender at each rank will be used to test operational hypotheses OH(D)(2a), OH(D)(2b), OH(D)(3a), OH(D)(3b), OH(D)(4a), and OH(D)(4b) of the model. The use of this design will determine what the effect of ability to pay is on male wages and female wages and whether the effect of ability to pay is the same for men and women. For the design, the condition of equal cell sizes will be met since the unit of analysis is the organization and ability to pay will be divided at the median so that half of the organizations will be above the median and half below. The F test will be used to determine whether there is any difference in group means. Tukey's multiple comparison test will then be used to show where the significant differences are between groups and to test the specific hypotheses of the model.

VARIABLE MEASURES

Data for each of the variable measures discussed below

is taken from records for the 1986 fiscal year. This is the most recent year for which national data for public sector universities is available (Center for Education Statistics, 1988). Data for measures of salary, ability to pay, willingness to pay, size, growth, geographic region and segregation is taken from information reported to the Department of Education in the HEGIS surveys. The remainder of the data used in the study will be obtained through various public records that will be specified below.

The dependent variable in each equation is average salary at the university. Independent variables include measures of ability to pay, willingness to pay, organizational characteristics, and the percentage of women faculty at the university. A description of each variable in its operational form is also included here.

Wages

The three measures of wages for the three separate wage models are: 1) average overall faculty salary at the university for each rank of assistant, associate, and full professors; 2) average salary for male professors at each rank; and, 3) average salary for female professors at each rank. Only the salaries of full-time instructional faculty on nine-month contracts are included. These faculty are most comparable in terms of job duties since all teach two semesters or three quarters. Over 85 percent of all full-time faculty are paid on a nine-month basis. Including

salaries for faculty on twelve-month contracts could introduce systematic differences in occupational structure in terms of different teaching and research expectations that could affect salaries differences (Center for Education Statistics, 1988). All salary information will be obtained from the HEGIS 1985-86 salary survey for full-time instructional faculty.

Ability to Pay

Because of the mixed results of past empirical studies concerning the role of ability to pay in wage determination, the specification of the ability to pay variables is an important part of this study. One measure of ability to pay that will be used is the state appropriation of funds per full-time enrolled student. State appropriations includes amounts received from the state legislative body for meeting current operating expenses. State appropriations is the largest single source of revenue for public universities and provides an average of 45 percent of a school's total revenue (Center for Education Statistics, 1988). Another measure of ability to pay used is the tuition per full-time enrolled student. Tuition provides an average of fifteen percent of total revenue for public institutions (Center for Education Statistics, 1988). The tuition measure used in the study includes in and out-of-state tuition and fees assessed

against students. Endowment income per full-time enrolled student will also be used to measure ability to pay since it is also a large source of funding for public institutions (Center for Education Statistics, 1988). The larger the amount of endowments the institution has, the more operating funds it has available and the less it has to rely on funds that could be used for salaries. Endowments are therefore an important funding source that results in greater ability to pay wages. State appropriation, tuition, and endowment figures come from the HEGIS financial statistics survey. Enrollment figures will be obtained from the HEGIS enrollment survey. State per capita income will also be used as a measure of ability to pay. This is the measure that has been used in past studies. Per capita income will be obtained from the Bureau of the Census report on state government tax collections.

Willingness to Pay

One measure of willingness to pay that will be used in the study is the percentage of budget spent on faculty salaries. This is defined as the current fund expenditure for general instruction and special instruction, taken as a percentage of the total current fund expenditure. The figures used to calculate the percentage will be obtained from the HEGIS financial statistics survey. Another

measure of willingness to pay that will be used is the state per capita expenditure on higher education. This measures the level of tax revenue that is actually spent on higher education. Per capita expenditure will bo obtained from the Bureau of the Census report on government finances. The measure of willingness to pay that has been used in past studies and will be included here is the state per capita tax rate. It will be obtained from the Bureau of the Census report on state government tax collections.

Organizational Characteristics

The influence of differing academic mix and skill requirements on university salary levels will be measured through a numerical count of the number of professional schools at the university including business, medical, law, engineering, architecture, and nursing schools. All of these professional programs except nursing represent areas that may have higher overall wages because of a greater demand for these professions outside of education. Higher salaries in these areas could increase the overall average at an institution. The inclusion of this variable attempts to control for inflated salary averages at the institution. Nursing programs on the other hand, represent a traditionally female area that may have lower wages because of the predominence of women teaching in that area. A professional nursing program could therefore lower the

average wage at a university. This will be accounted for be subtracting a nursing program from the count of the above professional programs. The count of professional schools will be determined from the American Council on Education's categorization of professional programs.

Other organizational characteristics will be measured as follows. Size will be measured as the number of full-time faculty at the university. Numbers will be obtained from the HEGIS salary survey.

Unionization will be measured with a zero-one dummy variable indicating whether a school is covered by a collective bargaining contract or not. This information will be obtained from the Directory of Faculty Contracts and Bargaining Agents annual report.

Geographic location will be measured with three dummy variables which will indicate whether a school is in one of the four major geographic regions of North Atlantic, Great Lakes and Plains, Southeast, and West and Southwest as defined by the Department of Commerce Office of Business Economic Regions. Classifications used to create the dummy variables will be taken from the HEGIS salary survey.

Growth will be measured as the percentage change in the number of full time faculty at the institution over the past ten years. Growth rate will be calculated from numbers of faculty reported in the HEGIS salary surveys for 1985-86 and 1975-76.

Segregation of women will be measured by comparing the percentage of women faculty by rank in the university for the current data year to the percentage of women by rank who were faculty ten years ago at each institution. As mentioned earlier, 1975 was chosen because it was the first year in which salary information was available by gender. Percentages will be calculated from figures in the HEGIS salary surveys for 1985-86 and 1975-76.

Each of the above variables will be collected for each organization in the sample. If any variable measure is missing from the observation, the mean value of the variable will be assigned to that observation (Pindyck and Rubinfeld, 1981). It is expected that there will only be a small proportion of missing data if any, since all information is public record.

SUMMARY

This chapter has presented the models, variables composing those models, and hypotheses following from those models that will be utilized to test the research questions addressed in the study. The chapter has developed the models and variables which will examine the factors influencing wage determination and gender-related wage differentials across organizations. It is expected that the independent variables included will explain a significant amount of the variance in wages and that

through analysis of ability to pay and the internal labor market, the process by which female faculty have lower wages on average than male faculty in the United States will be explained.

Chapter IV will next present the results obtained from the analysis of the models described in this chapter.

CHAPTER IV

RESULTS

INTRODUCTION

Chapter IV begins with a discussion of the sample summary statistics. Results of operational hypotheses testing the overall model of average wages at each job level of full, associate, and assistant rank are then presented. This discussion is followed by results of operational hypotheses testing the model of average wages for men at each level, then the model of average wages of women at each job level. Finally, results of hypotheses investigating the gender-related wage differential are presented.

DESCRIPTIVE STATISTICS

A summary of descriptive statistics of variables used in the models is discussed in this section. Table 1 provides statistics on number of faculty by rank and gender. Table 2 provides a summary of descriptive statistics for the measures of average wages used as dependent variables in the study. Table 3 provides a description of variables measuring ability and willingness to pay. Table 4 provides summary information for variables measuring organizational characteristics, and Table 5 provides descriptive information for variables measuring

the segregation of women.

Analysis of the sample descriptive statistics indicates that for the sample of 160 schools, the number of full-time instructional faculty on nine-month contracts at an institution ranged from 164 to 1,808 with a mean of 593 (see Appendix for list of universities included in the sample). Of those total faculty, 80.7% were men and 19.3% were women. The average number of women at the university was the greatest at the assistant professor rank, with a mean of 54 women (see Table 1).

Salary information indicates that the average overall salary at universities for the full-time faculty represented in the sample was $35,073 with a range from $24,357 to $51,858. Average salary at the university increased by rank, as did average salary for both men and women. Average salary for men was higher than average salary for women at each rank. The largest difference between men's and women's average salaries came at the professor rank, where men received an average of $42,792 and women received an average of $39,223, resulting in an average salary differential of $3,569 at the professor rank. The difference decreased from the professor to the associate rank, but increased again from the associate to assistant rank. At the associate professor level where men received an average of $32,746 and women an average of $30,820, the difference was $1,926. At the assistant

Table 1: Descriptive Statistics Summary
Faculty

VARIABLE	SUM	MEAN	STD	MIN	MAX
Total Faculty	98,815	593	309.8	164	1,808
Total Men	76,524	478	262.5	95	1,491
Total Women	18,291	115	55.4	26	317
Total Professors	39,563	247	177.4	27	889
Total Associate Professors	30,418	190	91.3	46	495
Total Assistant Professors	24,834	155	72.0	35	473
Total Men–Professors	32,248	226	163.4	24	829
Total Men–Associate Professors	24,058	151	73.0	30	375
Total Men–Assistant Professors	16,216	101	51.6	22	330
Total Women–Professors	3,315	21	18.0	2	97
Total Women–Associate Professors	6,360	40	21.8	9	120
Total Women–Assistant Professors	8,616	54	24.3	9	143
n = 160					

Table 2: Descriptive Statistics Summary
Average Salary

VARIABLE	MEAN	STD	MIN	MAX
Average Salary University	$35,073	$4,612.3	$24,566	$51,858
Average Salary Professors	$42,513	$5,694.7	$27,640	$59,102
Average Salary Associate Professors	$32,339	$2,709.1	$24,984	$39,090
Average Salary Assistant Professors	$27,269	$2,155.7	$21,776	$33,111
Average Salary Male Professors	$42,792	$5,754.4	$28,168	$59,734
Average Salary Male Associate Professors	$32,746	$2,728.8	$25,425	$39,431
Average Salary Male Assistant Professors	$28,074	$2,235.9	$22,667	$35,029
Average Salary Female Professors	$39,222	$5,025.6	$25,687	$53,242
Average Salary Female Associate Professors	$30,820	$2,748.1	$23,564	$37,944
Average Salary Female Assistant Professors	$25,753	$2,036.6	$21,196	$31,666
n = 160				

Table 3

Descriptive Statistics Summary
Ability and Willingness to Pay

VARIABLE	MEAN	STD	MIN	MAX
Ability to Pay				
State Appropriations per Full-Time Student	$6,194.10	$2,764.40	$512.90	$16,953.70
Endowment Income per Full-Time Student	$192.20	$261.30	$2.10	$1,566.30
Tuition per Full-Time Student	$2,310.60	$940.20	$203.70	$6,260.90
State Per Capita Income	$13,854.20	$1,966.00	$9,716.00	$19,600.00
Willingness to Pay				
Percent of Budget Spent on Instruction	38.70%	7.3	22.60%	58.10%
Per Capita Expenditure on Higher Education	$246.30	57.5	$125.40	$329.80
Per Capita Tax Rate	6.30%	0.1	2.90%	12.00%
n = 160				

Table 4

Descriptive Statistics Summary
Organizational Characteristics

VARIABLE	SUM	MEAN	STD	MIN	MAX
Size	98,815	593	309.8	164	1,808
Growth Rate		12.7%	0.2	-17.0%	89.1%
Professional Program		2.7	1.1	1	5
Union	33				
North Atlantic Region	20				
Great Lakes and Plains Region	44				
Southeast Region	45				
West and Southwest Region	51				
n = 160					

Table 5

Descriptive Statistics Summary
Segregation of Women

VARIABLE	MEAN	STD	MIN	MAX
1985 – 1986				
Percentage of Women – University	20.20%	5.60%	11.40%	42.10%
Percentage of Women – Professors	8.80%	5.30%	1.20%	36.60%
Percentage of Women – Associate Professors	21.10%	6.00%	8.40%	39.00%
Percentage of Women – Assistant Professors	35.30%	7.60%	19.80%	62.70%
1975 – 1976				
Percentage of Women – University	15.80%	5.20%	4.30%	36.10%
Percentage of Women – Professors	2.20%	1.40%	0.00%	7.90%
Percentage of Women – Associate Professors	4.30%	1.90%	0.78%	15.70%
Percentage of Women – Assistant Professors	9.30%	3.40%	2.70%	26.60%

professor rank, men's average salary was $28,074 and women's was $25,753, resulting in a difference of $2,321 (see Table 2).

Ability and willingness to pay measures show an average state appropriation of $6,194 per full-time student, mean endowment income of $192 per full-time student and mean tuition revenue of $2,310 per student. State per capita income had a mean of $13,854. Willingness to pay variables reveal that an average of 38.7% of total university current fund expenditures were spent on instruction. State per capita expenditure on higher education averaged $246 and state per capita tax rate averaged 6.34% (see Table 3).

Analysis of the organizational characteristics variables reveals that the growth rate for faculty over the past ten years had a mean of 12.7% with a range of -17% to 89%. (This variable and the segregation variable discussed below were calculated using mean values for nine universities that did not report data for 1975-76). The union indicator variable shows that 33 schools were covered by a collective bargaining contract and 127 were not. The geographic location variables show that 20 schools were located in the North Atlantic region, 44 were in the Great Lakes and Plains region, 45 were in the Southeast region and 51 were in the West and Southwest region. The average number of professional programs counted at the schools was

2.7. The minimum was one possible program and the maximum was five (see Table 4).

The percentage of women in the university ranged from a high of 42.1% to a low of 11.4%. The percentage of women was the largest at the assistant professor rank, where there was an average of 35.3% women. The percentage of women decreased by rank, with an average of 21.1% women at the associate rank, and 8.8% at the full rank. The statistics from 1975-76 indicate that the percentage of women increased at all levels over the ten year period. In 1975-76, there were an average of 2.2% women at the professor rank, 4.3% women at the associate rank, and 9.3% women at the assistant rank (see Table 5).

Test for Segregation

The discussion of past studies of gender-related wage differentials indicated that a negative relationship between the percentage of women in the organization and average wages had been found. Operational hypotheses were developed to test for the segregation of women into low wage organizations and for the relationship between the average wages of an organization and the organization's relative standing in an across organization wage hierarchy.

Simple regression analysis was utilized to test operational hypotheses OH(S)(1a), OH(S)(1b), and OH(S)(1c). These hypotheses test the relationship between percentage

of women and average wage, average male wage, and average female wage at each job level across organizations. The regression coefficients and significance levels are presented in Table 6, which summarizes results of these hypotheses.

> OH(S)(1a): There will be a significant ($p < .05$) negative relationship between percentage female and average wage at each job level.
>
> OH(S)(1b): There will be a significant ($p < .05$) negative relationship between percentage female and average male wage at each job level.
>
> OH(S)(1c): There will be a significant ($p < .05$) negative relationship between percentage female and average female wage at each job level.

Operational Hypothesis OH(S)(1a) is supported at each job level. As seen in Table 6, a significant negative relationship was found between percentage female and average wage of professors, (parameter estimate = -275.69, $t = -3.37$, prob > $t = .001$), associate professors (parameter estimate = -110.79, $t = -3.14$, prob > $t = .002$), and assistant professors (parameter estimate = -97.62, $t = -4.63$, prob > $t = .0001$).

Operational Hypothesis OH(S)(1b) is also supported at each rank. A significant negative relationship was found between percentage female and average wage of male professors (parameter estimate = -260.17, $t = -3.12$, prob > $t = .002$), male associate professors (parameter estimate = -92.14, $t = -2.53$, prob > $t = .012$), and male assistant

Table 6

Test of Hypotheses OH(S)(1a), OH(S)(1b), OH(S)(1c)

Dependent Variable: Average Salary Full Professor Rank

SOURCE	DF	SS	MS	F	PROB > F
Model	1	345001605	345001605	11.33	0.0010
Error	158	4811336569	30451497		
Total	159	5156338171			
R-SQUARE = .07					

PARAMETER ESTIMATES

VARIABLE		PARAMETER ESTIMATE	STANDARD ERROR	T FOR H0: PARAM = 0	PROB > T
Intercept		44942.47	843.34	53.29	0.0001
Percentage Female		-275.69	81.91	-3.37	0.0010

Dependent Variable: Average Salary Associate Professor Rank

SOURCE	DF	SS	MS	F	PROB > F
Model	1	65451803	65451802	9.88	0.0020
Error	158	1046582677	6623940		
Total	159	1112034480			
R-SQUARE = .06					

PARAMETER ESTIMATES

VARIABLE		PARAMETER ESTIMATE	STANDARD ERROR	T FOR H0: PARAM = 0	PROB > T
Intercept		34614.29	770.26	44.94	0.0001
Percentage Female		-110.79	35.24	-3.14	0.0020

Dependent Variable: Average Salary Assistant Professor Rank

SOURCE	DF	SS	MS	F	PROB > F
Model	1	88262669	88262669	21.43	0.0001
Error	158	650650388	4118040		
Total	159	738913058			
R-SQUARE = .12					

PARAMETER ESTIMATES

VARIABLE		PARAMETER ESTIMATE	STANDARD ERROR	T FOR H0: PARAM = 0	PROB > T
Intercept		30715.90	761.55	40.33	0.0001
Percentage Female		-97.62	21.09	-4.63	0.0001

Table 6 (con't)

Test of Hypotheses OH(S)(1a), OH(S)(1b), OH(S)(1c)

Dependent Variable: Average Male Salary Full Professor Rank

SOURCE	DF	SS	MS	F	PROB > F
Model	1	307240409	307240409	9.79	0.0020
Error	158	4957762991	31378247		
Total	159	5265003400			
R-SQUARE = .06					

PARAMETER ESTIMATES

VARIABLE		PARAMETER ESTIMATE	STANDARD ERROR	T FOR H0: PARAM = 0	PROB > T
Intercept		45085.06	856.08	52.66	0.0001
Percentage Female		-260.17	83.14	-3.12	0.0021

Dependent Variable: Average Male Salary Associate Professor Rank

SOURCE	DF	SS	MS	F	PROB > F
Model	1	44091816	44091816	6.42	0.0120
Error	158	1085043920	6867367		
Total	159	1129135736			
R-SQUARE = .04					

PARAMETER ESTIMATES

VARIABLE		PARAMETER ESTIMATE	STANDARD ERROR	T FOR H0: PARAM = 0	PROB > T
Intercept		34640.69	792.9	43.69	0.0001
Percentage Female		-92.14	36.36	-2.53	0.0123

Dependent Variable: Average Male Salary Assistant Professor Rank

SOURCE	DF	SS	MS	F	PROB > F
Model	1	67046280	67046280	14.55	0.0002
Error	158	727855874	4606683		
Total	159	794902154			
R-SQUARE = .08					

PARAMETER ESTIMATES

VARIABLE		PARAMETER ESTIMATE	STANDARD ERROR	T FOR H0: PARAM = 0	PROB > T
Intercept		31077.93	805.46	38.58	0.0001
Percentage Female		-85.08	22.3	-3.81	0.0002

Table 6 (con't)

Test of Hypotheses OH(S)(1a), OH(S)(1b), OH(S)(1c)

Dependent Variable: Average Female Salary Full Professor Rank

SOURCE	DF	SS	MS	F	PROB > F
Model	1	177175711	177175711	7.78	0.0050
Error	158	3596641601	22763554		
Total	159	3773817313			
R-SQUARE = .04					

PARAMETER ESTIMATES

VARIABLE		PARAMETER ESTIMATE	STANDARD ERROR	T FOR H0: PARAM = 0	PROB > T
Intercept		40896.04	753.27	54.29	0.0001
Percentage Female		-212.18	76.05	-2.79	0.0059

Dependent Variable: Average Female Salary Associate Professor Rank

SOURCE	DF	SS	MS	F	PROB > F
Model	1	41570192	41570192	6.18	0.0140
Error	158	1062145000	6722437		
Total	159	1103715193			
R-SQUARE = .03					

PARAMETER ESTIMATES

VARIABLE		PARAMETER ESTIMATE	STANDARD ERROR	T FOR H0: PARAM = 0	PROB > T
Intercept		32666.71	774.14	42.2	0.0001
Percentage Female		-88.39	35.54	-2.49	0.0139

Dependent Variable: Average Female Salary Assistant Professor Rank

SOURCE	DF	SS	MS	F	PROB > F
Model	1	32920570	32920570	8.3	0.0040
Error	158	626562734	3965587		
Total	159	659483305			
R-SQUARE = .05					

PARAMETER ESTIMATES

VARIABLE		PARAMETER ESTIMATE	STANDARD ERROR	T FOR H0: PARAM = 0	PROB > T
Intercept		27857.87	747.31	37.28	0.0001
Percentage Female		-59.62	20.69	-2.88	0.0045

professors (parameter estimate = -85.08, t = -3.81, prob > t = .0002).

Operational Hypothesis OH(S)(1c) is supported at each rank. A significant negative relationship was found between percentage female and average wage of female professors (parameter estimate = -212.18, t = -2.79, prob > t = .005), female associate professors (parameter estimate = -88.39, t = -2.49. prob > t = .014), and female assistant professors (parameter estimate = -59.62, t = -2.88, prob > t = .0045).

The next section will discuss results of operational hypotheses testing the overall model of average wage determination.

A MODEL OF AVERAGE WAGE DETERMINATION

The model of average wages developed in the previous chapters proposed that average wages across organizations were determined by ability to pay, willingness to pay, organizational characteristics, and the working of the internal labor market across job levels.

Multiple regression analysis was utilized to test operational hypotheses OH(A)(1) through OH(A)(8). These hypotheses test the relationship between average wage and

ability to pay, willingness to pay, organizational characteristics, and percentage of women in the organization. A General Linear Model (GLM) regression procedure was run with average wage as the dependent variable and ability to pay, willingness to pay, organizational characteristics, and percentage female as the independent variables, in order to examine the effect of each variable in the model when all other variables are accounted for. The Type III SS (sum of squares) obtained from the GLM procedure was utilized to examine the unique contribution of each independent variable. The Type III SS are appropriate for this purpose as they yield a partial F-test which represents the contribution of the independent variable as the last variable entered into the regression model, i.e. the significance of one independent variable when controlling for the presence of all other independent variables. Results of operational hypotheses investigating the determinants of average wages are presented below for tests of the model at each job level and summarized in Table 7 for average salary at the professor rank, Table 8 for average salary at the associate professor rank, and Table 9 for the assistant professor rank. The results of the combination of the ability to pay variables and willingness to pay variables into composite measures will be presented before discussion of the results of operational hypotheses however, since the composite measure

of ability to pay was used in each equation of the determinants of average wages.

In order to form the ability to pay composite variable, a regression with average wage at the university as the dependent variable was run with only ability to pay variables as independent variables using the stepwise MAXR technique. This resulted in three significant ability to pay measures: 1) state appropriations per full-time student; 2) endowment income per full-time student; and, 3) state per capita income. The fourth ability to pay variable, tuition per full-time student, was not significant in the average wage equation and provided no significant improvement to the overall R^2 value for the regression equation. The three significant ability to pay measures were then standardized and used as independent variables in a multiple regression equation with average wage at the university as the dependent variable. This regression established the regression coefficients that were then used as weights to form the composite (state appropriation per full-time student, beta = 1280; endowment income per full-time student, beta = 1329; state per capita income, beta = 2500). Each standardized ability to pay measure was multiplied by its respective weight and measures were summed to form the composite. The same technique was used to form a willingness to pay composite variable. A regression with average wage at the university

as the dependent variable was run with only willingness to pay variables as independent variables using the stepwise MAXR technique. This resulted in one significant willingness to pay measure, state per capita tax rate. The other two willingness to pay variables, percent of the budget spent on tuition and state per capita expenditure on higher education were not significant in the average wage equation and provided no significant improvement to the overall R^2 value for the regression equation. Those variables therefore, were not included in a composite measure and only state per capita tax rate was used to measure willingness to pay in subsequent wage equations.

Ability to Pay: Operational hypothesis OH(A)(1) tests the relationship between average wage and ability to pay:

> OH(A)(1): There will be a significant positive ($p < .05$) relationship between average wage and ability to pay when controlling for other independent variables.

Operational hypothesis OH(A)(1) is supported at the full professor rank: A significant positive relationship (Type III SS = 1514653095.10, F = 149.31, prob > F = .0001) was found between average wage of professors and ability to pay when controlling for the presence of willingness to pay, organizational characteristics of size, union, growth, geographic region, professional programs and controlling for the percentage of women (see Table 7).

Table 7

Test of Hypotheses OH(A)(1) through OH(A)(8)

GLM PROCEDURE

Dependent Variable: Average Salary Full Professor Rank

SOURCE	DF	SS	MS	F	PROB > F
Model	10	3644814961.44	364481496.14	35.93	0.0001
Error	149	1511523209.61	10144451.07		
Total	159	5156338171.05			
R-SQUARE = .71					

TYPE III S

SOURCE	TYPE III S		F VALUE		PROB > F
Ability to Pay	1514653095.10		149.31		0.0001
Willingness to Pay	102444491.56		10.1		0.0018
Size	332072761.32		32.73		0.0001
Unionization	44103292.97		4.35		0.0388
Growth	63595.60		0.01		0.937
North Atlantic	51806038.49		5.11		0.0253
Great Lakes	498634.07		0.05		0.8248
Southeast	65190655.54		6.43		0.0123
Academic Mix	21949852.82		2.16		0.1434
Percentage Female	191855407.77		18.91		0.0001

PARAMETER ESTIMATES

VARIABLE		PARAMETER EST	STD ERROR	T FOR H0: PARAM = 0	PROB > T
Intercept		41480.42	1490.52	27.83	0.0001
Ability to Pay		1.06	0.09	12.22	0.0001
Willingness to Pay		823.12	259.02	3.18	0.0018
Size		5.91	1.03	5.72	0.0001
Unionization		-1430.29	685.96	-2.09	0.0388
Growth		80.74	1019.78	0.08	0.937
North Atlantic		2019.5	893.65	2.26	0.0253
Great Lakes		-151.99	685.54	-0.22	0.8248
Southeast		1766.8	696.96	2.54	0.0123
Academic Mix		-399.87	271.84	-1.47	0.1434
Percentage Female		-222.63	51.19	-4.35	0.0001

Table 8

Test of Hypotheses OH(A)(1) through OH(A)(8)

GLM PROCEDURE

Dependent Variable: Average Salary Associate Professor Rank

SOURCE	DF	SS	MS	F	PROB > F
Model	10	685386287.43	68538628.74	21.21	0.0001
Error	149	481571297.51	3232022.13		
Total	159	1166957584.95			
R-SQUARE = .59					

TYPE III S

SOURCE	TYPE III S		F VALUE		PROB > F
Ability to Pay	266410924.07		82.43		0.0001
Willingness to Pay	17946375.65		5.55		0.0198
Size	64252428.22		19.88		0.0001
Unionization	439121.61		0.14		0.7129
Growth	377595.90		0.12		0.7330
North Atlantic	25716713.97		7.96		0.0054
Great Lakes	284475.26		0.09		0.7671
Southeast	12922379.08		4.00		0.0474
Academic Mix	11540971.35		3.57		0.0607
Percentage Female	45079965.67		13.95		0.0003

PARAMETER ESTIMATES

VARIABLE		PARAMETER EST	STD ERROR	T FOR H0: PARAM = 0	PROB > T
Intercept		32655.55	934.75	34.94	0.0001
Ability to Pay		0.44	0.05	9.08	0.0001
Willingness to Pay		345.07	146.44	2.36	0.0198
Size		2.63	0.59	4.46	0.0001
Unionization		-143.6	389.59	-0.37	0.7129
Growth		196.8	575.78	0.34	0.7330
North Atlantic		1423.55	504.67	2.82	0.0054
Great Lakes		115.11	387.99	0.30	0.7671
Southeast		779.52	389.84	2.00	0.0474
Academic Mix		-299.96	158.74	-1.89	0.0607
Percentage Female		-97.02	25.98	-3.73	0.0003

Table 9

Test of Hypotheses OH(A)(1) through OH(A)(8)

GLM PROCEDURE

Dependent Variable: Average Salary Assistant Professor Rank

SOURCE	DF	SS	MS	F	PROB > F
Model	10	459706988.63	45970698.86	24.53	0.0001
Error	149	279206069.05	1873866.24		
Total	159	738913057.68			
R-SQUARE = .62					

TYPE III S

SOURCE	TYPE III S		F VALUE		PROB > F
Ability to Pay	175014699.99		93.4		0.0001
Willingness to Pay	7177159.70		3.83		0.0522
Size	48767330.49		26.02		0.0001
Unionization	6021492.72		3.21		0.0751
Growth	34829.53		0.02		0.8917
North Atlantic	460042.82		0.25		0.6210
Great Lakes	905990.59		0.48		0.4879
Southeast	844031.49		0.45		0.5032
Academic Mix	3093016.44		1.65		0.2009
Percentage Female	30085344.56		16.06		0.0001

PARAMETER ESTIMATES

VARIABLE		PARAMETER EST	STD ERROR	T FOR H0: PARAM = 0	PROB > T
Intercept		28683.54	818.53	35.04	0.0001
Ability to Pay		0.36	0.04	9.66	0.0001
Willingness to Pay		219.75	112.29	1.96	0.0522
Size		2.27	0.44	5.10	0.0001
Unionization		-524.94	292.84	-1.79	0.0751
Growth		-59.79	438.56	-0.14	0.8917
North Atlantic		-191.51	386.52	-0.50	0.6210
Great Lakes		-204.73	294.44	-0.70	0.4879
Southeast		199.92	297.88	0.67	0.5032
Academic Mix		-148.90	115.90	-1.28	0.2009
Percentage Female		-61.71	15.40	-4.01	0.0001

Operational hypothesis OH(A)(1) is also supported at the associate professor rank. A significant positive relationship (Type III SS = 266410924.07, F = 82.43, prob > F = .0001) was found between average wage of associate professors and ability to pay when controlling for the presence of willingness to pay, organizational characteristics of size, union, growth, geographic region, professional programs and controlling for the percentage of women (see Table 8).

Operational hypothesis OH(A)(1) is also supported at the assistant professor rank. A significant positive relationship (Type III SS = 175014699.99, F = 93.40, prob > F = .0001) was found between average wage of assistant professors and ability to pay when controlling for the presence of willingness to pay, organizational characteristics of size, union, growth, geographic region, professional programs and controlling for the percentage of women (see Table 9).

Willingness to Pay: Operational hypothesis OH(A)(2) tests the relationship between average wage and willingness to pay:

> OH(A)(2): There will be a significant positive ($p < .05$) relationship between average wage and willingness to pay when controlling for other independent variables.

Operational hypothesis OH(A)(2) is supported at the professor rank: A significant positive relationship (Type III SS = 102444491.56, F = 10.10, prob > F = .0018) was for the presence of willingness to pay, organizational characteristics of size, union, growth, geographic region, professional programs and controlling for the percentage of women (see Table 7).

Operational hypothesis OH(A)(1) is also supported at the associate professor rank. A significant positive relationship (Type III SS = 266410924.07, F = 82.43, prob > F = .0001) was found between average wage of associate professors and ability to pay when controlling for the presence of willingness to pay, organizational characteristics of size, union, growth, geographic region, professional programs and controlling for the percentage of women (see Table 8).

Operational hypothesis OH(A)(1) is also supported at the assistant professor rank. A significant positive relationship (Type III SS = 175014699.99, F = 93.40, prob > F = .0001) was found between average wage of assistant professors and ability to pay when controlling for the presence of willingness to pay, organizational characteristics of size, union, growth, geographic region,

women (see Table 9).

Willingness to Pay: Operational hypothesis OH(A)(2) tests the relationship between average wage and willingness to pay:

> OH(A)(2): There will be a significant positive ($p < .05$) relationship between average wage and willingness to pay when controlling for other independent variables.

Operational hypothesis OH(A)(2) is supported at the professor rank: A significant positive relationship (Type III SS = 102444491.56, F = 10.10, prob > F = .0018) was found between average wage of professors and the willingness to pay measure per capita tax rate when controlling for the presence of ability to pay, organizational characteristics of size, union, growth, geographic region, professional programs and controlling for the percentage of women.

Operational hypothesis OH(A)(2) is also supported at the associate professor rank: A significant positive relationship (Type III SS = 17946375.65, F = 5.55, prob > F = .0198) was found between average wage of associate professors and willingness to pay when controlling for the presence of ability to pay, organizational characteristics of size, union, growth, geographic region, professional programs and controlling for the percentage of women.

Operational hypothesis OH(A)(2) is also supported at the assistant professor rank: A significant positive relationship (Type III SS = 7177159.70, F = 3.83, prob > F = .0522) was found between average wage of assistant professors and willingness to pay when controlling for the presence of ability to pay, organizational characteristics of size, union, growth, geographic region, professional programs and controlling for the percentage of women.

Size: Operational hypothesis OH(A)(3) tests the relationship between average wage and the organizational characteristic of size:

> OH(A)(3): There will be a significant positive ($p < .05$) relationship between average wage and size when controlling for other independent variables.

Operational hypothesis OH(A)(3) is supported at the professor rank: A significant positive relationship (Type III SS = 332072761.32, F = 32.73, prob > F = .0001) was found between the average wage of professors and the organizational characteristic variable size when controlling for the presence of ability to pay, other organizational characteristics of union, growth, geographic region, professional programs and controlling for the percentage of women.

Operational hypothesis OH(A)(3) is also supported at the associate professor rank: A significant positive relationship (Type III SS = 64252428.22, F = 19.88, prob > F = .0001) was found between the average wage of associate professors and size when controlling for the presence of ability to pay, other organizational characteristics of union, growth, geographic region, professional programs and controlling for the percentage of women.

Operational hypothesis OH(A)(3) is also supported at the assistant professor rank: A significant positive relationship (Type III SS = 48767330.49, F = 26.02, prob > F = .0001) was found between the average wage of assistant professors and size when controlling for the presence of ability to pay, other organizational characteristics of union, growth, geographic region, professional programs and controlling for the percentage of women.

Unionization: Operational hypothesis OH(A)(4) tests the relationship between average wage and the organizational characteristic of unionization:

> OH(A)(4): There will be a significant positive ($p < .05$) relationship between average wage and unionization when controlling for other independent variables.

Operational hypothesis OH(A)(4) is not supported at the professor rank: A significant negative relationship

instead of the positive relationship predicted (Type III SS = 44103292.97, F = 4.35, prob > F = .0388; parameter estimate = -1430.29, t = -2.09, prob > t = .0388) was found between the average wage of professors and the organizational characteristic variable unionization when controlling for the presence of ability to pay, other organizational characteristics of size, growth, geographic region, professional programs and controlling for the percentage of women.

Operational hypothesis OH(A)(4) is not supported at the associate professor rank: No significant relationship (Type III SS = 439121.61, F = 0.14, prob > F = .7129) was found between the average wage of associate professors and unionization when controlling for the presence of ability to pay, other organizational charactersitics of size, growth, geographic region, professional programs and controlling for the percentage of women.

Operational hypothesis OH(A)(4) is not supported at the assistant professor rank: No significant relationship (Type III SS = 6021492.72, F = 3.21, prob > F = .0751) was found between the average wage of assistant professors and unionization when controlling for the presence of ability to pay, other organizational characteristics of size, growth, geographic region, professional programs and

controlling for the percentage of women.

Growth: Operational hypothesis OH(A)(5) tests the relationship between average wage and the organizational characteristic of growth:

> OH(A)(5): There will be a significant positive ($p < .05$) relationship between average wage and growth when controlling for other independent variables.

Operational hypothesis OH(A)(5) is not supported at the professor rank: No significant relationship (Type III SS = 63595.60, F = 0.01, prob > F = .9370) was found between the average wage of professors and growth when controlling for the presence of ability to pay, other organizational characteristics of size, unionization, geographic region, professional programs and controlling for the percentage of women.

Operational hypothesis OH(A)(5) is also not supported at the associate professor rank: No significant relationship (Type III SS = 377595.90 F = 0.12, prob > F = .7330) was found between the average wage of associate professors and growth when controlling for the presence of ability to pay, other organizational characteristics of size, unionization, geographic region, professional programs and controlling for the percentage of women.

Operational hypothesis OH(A)(5) is also not supported at the assistant professor rank: No significant relationship (Type III SS = 34829.53, F = 0.02, prob > F = .8917) was found between the average wage of assistant professors and growth when controlling for the presence of ability to pay, other organizational characteristics of size, unionization, geographic region, professional programs and controlling for the percentage of women.

Geographic Region: Operational hypothesis OH(A)(6) tests the relationship between average wage and the organizational characteristic of geographic region:

> OH(A)(6): There will be a significant ($p < .05$) relationship between average wage and geographic region when controlling for other independent variables.

Operational hypothesis OH(A)(6) is supported at the professor rank. Relative to the West-Southwest region, wages in the North Atlantic region and the Southeast were significantly higher (parameter estimate = 2019.50, t = 2.26, prob > t = .0253 for North Atlantic region; parameter estimate = 1766.80, t = 2.54, prob > t = .0123 for the Southeast region) when controlling for the presence of ability to pay, other organizational characteristics of size, unionization, growth, professional programs and controlling for the percentage of women.

Operational hypothesis OH(A)(6) is also supported at the associate professor rank. Relative to the West-Southwest region, wages in the North Atlantic region and the Southeast were again significantly higher (parameter estimate = 1423.55, t = 2.82, prob > t = .0054 for North Atlantic region; parameter estimate = 779.52, t = 2.00, prob > t = .0474 for the Southeast region) when controlling for the presence of ability to pay, other organizational characteristics of size, unionization, growth, professional programs and controlling for the percentage of women.

Operational hypothesis OH(A)(6) is not supported at the assistant professor rank: There were no significant differences between average wages across any of the geographic regions when controlling for the presence of ability to pay, other organizational characteristics of size, unionization, growth, professional programs and controlling for the percentage of women.

Academic Mix: Operational hypothesis OH(A)(7) tests the relationship between average wage and the organizational characteristic of academic mix influences on wages:

> OH(A)(7): There will be a significant positive ($p < .05$) relationship between average wage and academic mix when controlling for other independent variables.

Operational hypothesis OH(A)(7) is not supported at the

professor rank: No significant relationship (Type III SS = 21949852.82, F = 2.16, prob > F = .1434) was found between the average wage of professors and the organizational characteristic variable academic mix when controlling for the presence of ability to pay, other organizational characteristics of size, unionization, growth, geographic region, and controlling for the percentage of women.

Operational hypothesis OH(A)(7) is also not supported at the associate professor rank: No significant relationship (Type III SS = 11540971.35, F = 3.57, prob > F = .0607) was found between the average wage of associate professors and the organizational characteristic variable academic mix when controlling for the presence of ability to pay, other organizational characteristics of size, unionization, growth, geographic region, and controlling for the percentage of women.

Operational hypothesis OH(A)(7) is also not supported at the assistant professor rank: No significant relationship (Type III SS = 3093016.44, F = 1.65, prob > F = .2009) was found between the average wage of assistant professors and the organizational characteristic variable academic mix when controlling for the presence of ability to pay, other organizational characteristics of size, unionization, growth, geographic region, and controlling for the

percentage of women.

Percentage of Women: Operational hypothesis OH(A)(8) tests the relationship between average wage and the percentage of female faculty:

> OH(A)(8): There will not be a significant negative ($p < .05$) relationship between average wage and percentage female when ability to pay, willingness to pay, and organizational characteristics are controlled for.

Operational hypothesis OH(A)(8) is not supported at the professor rank: A significant negative relationship (Type III SS = 191855407.77, F = 18.91, prob > F = .0001) was found between the average wage of professors and percentage female when controlling for the presence of ability to pay, willingness to pay and the organizational characteristics of size, union, growth, geographic region and professional programs.

Operational hypothesis OH(A)(8) is also not supported at the associate professor rank: A significant negative relationship (Type III SS =45079965.67, F = 13.95, prob > F = .0003) was found between the average wage of associate professors and percentage female when controlling for the presence of ability to pay, willingness to pay and the organizational characteristics of size, union, growth, geographic region and professional programs.

Operational hypothesis OH(A)(8) is also not supported at the assistant professor rank: A significant negative relationship (Type III SS = 30085344.56, F = 16.06, prob > F = .0001) was found between the average wage of assistant professors and percentage female when controlling for the presence of ability to pay, willingness to pay and the organizational characteristics of size, union, growth, geographic region and professional programs.

Internal Labor Market Hypotheses

Operational hypotheses OH(A)(9) and OH(A)(10) test the relationship between ability to pay and the internal labor market. A reduced multiple regression analysis with only the ability to pay composite and willingness to pay variables was utilized to test operational hypothesis OH(A)(9). The ability to pay and willingness to pay regression coefficients were compared across equations of average wages by rank in order to determine whether ability and willingness to pay variables had more influence on wages at upper ranks. R^2 values were also compared to examine effect size across equations. An F-test to determine whether variances in averages wages across ranks were equal was used to test OH(A)10. Results of operational hypotheses investigating the working of the

internal labor market are presented below and summarized in Tables 10 and 11.

Operational hypothesis OH(A)(9) tests whether ability and willingness to pay are more predictive of wages at upper job levels:

> OH(A)(9): Ability to pay and willingness to pay will be more predictive of wages at the full than associate level and at the associate than assistant level.

Operational hypothesis OH(A)(9) received partial support. The regression coefficients for ability to pay and willingness to pay show an increasing effect of ability and willingness to pay with rank. The regression coefficients for the ability to pay and willingness to pay variables are significant at all ranks, but they are larger at the full professor rank (parameter estimate = 1.18, t = 13.93, prob > t = .0001 for ability to pay; parameter estimate = 977.43, t = 3.25, prob > t = .0014 for willingness to pay) than the associate professor rank (parameter estimate = .52, t = 11.57, prob > t = .0001 for ability to pay; parameter estimate = 415.94, t = 2.64, prob > t = .0090 for willingness to pay, and are larger at the associate rank than at the assistant professor rank (parameter estimate = .42, t = 12.45, prob > t = .0001 for ability to pay; parameter estimate = 221.33, t = 1.95, prob > t = .0532 for willingness to pay).

Tests of the R^2 values show that while ability to pay is most predictive of wages at the full level, there is no difference in the explanatory power of the models at the associate and assistant levels. The R^2 value was the largest at the full level at .56, which would be expected according to internal labor market theory. The value of .49 at the assistant level, however, was slightly higher than the value at the associate level of .47. F tests of the R^2 values show that while there is a significance between the values for the full rank v. the associate (F = 10.00, prob F > .05), there is no significant difference between the values at the associate and assistant ranks (F = 2.08).

Operational hypothesis OH(A)(10) tests whether ability and willingness to pay are more predictive of wages at upper job levels by determining whether there is more variance in wages at upper job levels:

> OH(A)(10): Variance in average wage across organizations will increase from assistant to associate and from associate to full professor level.

Operational hypothesis OH(A)(10) is supported. As seen in Table 11, variance in wages increased as predicted from the assistant to associate ranks and also from the associate to full rank. Variances were sigificantly different across ranks. The variance in wages was the smallest at the

assistant professor rank at 4,647,258. The variance increased to 7,339,331 at the associate rank and increased to 32,429,835 at the full rank. An F-test of variances at the full and associate ranks showed a significance difference in the variance of average wages across ranks (F = 4.42, prob F > .0001). An F-test of variances at the full and assistant ranks also showed a significant difference in the variance of average wages across ranks (F = 6.98, prob F > .0001). Also, an F-test of variances at the associate and assistant ranks showed a significance difference in the variance of average wages across ranks (F = 1.58, prob F > .0042).

The next section will discuss results of operational hypotheses testing the model of average male wages.

A MODEL OF AVERAGE MALE WAGES

The model of average male wages developed in the previous chapters proposed that average male wages across organizations were determined by ability to pay, willingness to pay, organizational characterisitcs, and the working of the internal labor market across job levels.

Operational hypotheses OH(M)1 through OH(M)8 were tested in the same manner as in the general model of average wages, using multiple regression analysis and the

Table 10

Test of Hypotheses OH(A)(9)

Multiple Regression

Dependent Variable: Average Salary Full Professor Rank

F = 101.20 Prob > F = .0001

R-SQUARE = .56

PARAMETER ESTIMATES

VARIABLE		PARAMETER EST.	STD ERROR	T FOR H0: PARAM = 0	PROB > T
Intercept		42513.14	299.45	141.97	0.0001
Ability to Pay		1.18	0.08	13.93	0.0001
Willingness to Pay		977.43	300.50	3.25	0.0014

Dependent Variable: Average Salary Associate Professor Rank

F = 69.79 Prob > F = .0001

R-SQUARE = .47

PARAMETER ESTIMATES

VARIABLE		PARAMETER EST.	STD ERROR	T FOR H0: PARAM = 0	PROB > T
Intercept		32339.46	156.82	206.22	0.0001
Ability to Pay		0.52	0.04	11.57	0.0001
Willingness to Pay		415.94	157.37	2.64	0.0090

Dependent Variable: Average Salary Assistant Professor Rank

F = 74.57 Prob > F = .0001

R-SQUARE = .49

PARAMETER ESTIMATES

VARIABLE		PARAMETER EST.	STD ERROR	T FOR H0: PARAM = 0	PROB > T
Intercept		27269.36	122.82	220.02	0.0001
Ability to Pay		0.42	0.03	12.45	0.0001
Willingness to Pay		221.33	113.58	1.95	0.0532

Table 11

Test of Hypothesis OH(A)(10)

COMPARISON	VARIANCE	F FOR HO: PARAM = 0	PROB > F
Average Salary – Full Rank to Average Salary – Associate Rank	32429835 7339331	4.42	0.0001
Average Salary – Full Rank to Average Salary – Assistant Rank	32429835 4647258	6.98	0.0001
Average Salary – Associate Rank to Average Salary – Assistant Rank	7339331 4647258	1.58	0.0042

GLM technique. The hypotheses being examined here test the relationship between the dependent variable, average male wage, and independent variables ability to pay, willingness to pay, each organizational characteristic variable, and percentage of women in the organization. Results of operational hypotheses investigating the determinants of average male wages are presented below for tests of the model at each job level and summarized in Table 12 for average male salary at the professor rank, Table 13 for average male salary at the associate professor rank, and Table 14 for the assistant professor rank.

Ability to Pay: Operational hypothesis OH(M)(1) tests the relationship between average male wage and ability to pay:

> OH(M)(1): There will be a significant positive ($p < .05$) relationship between average male wage and ability to pay when controlling for other independent variables.

Operational hypothesis OH(M)(1) is supported at the professor rank: A significant positive relationship (Type III SS = 1550956545.31, F = 147.31, prob > F = .0001) was found between average wage of male professors and ability to pay when controlling for the presence of willingness to pay, organizational characteristics of size, union, growth, geographic region, professional programs and controlling for the percentage of women (see Table 12).

Operational hypothesis OH(M)(1) is also supported at the associate professor rank. A significant positive relationship (Type III SS = 232999010.32, F = 68.51, prob > F = .0001) was found between average wage of male associate professors and ability to pay when controlling for the presence of willingness to pay, organizational characteristics of size, union, growth, geographic region, professional programs and controlling for the percentage of women (see Table 13).

Operational hypothesis OH(M)(1) is also supported at the assistant professor rank. A significant positive relationship (Type III SS = 175892506.92, F = 77.89, prob > F = .0001) was found between average wage of male assistant professors and ability to pay when controlling for the presence of willingness to pay, organizational characteristics of size, union, growth, geographic region, professional programs and controlling for the percentage of women (see Table 14).

Willingness to Pay: Operational hypothesis OH(M)(2) tests the relationship between average male wage and willingness to pay:

> OH(M)(2): There will be a significant positive ($p < .05$) relationship between average male wage and willingness to pay when controlling for other independent variables.

Operational hypothesis OH(M)(2) is supported at the professor rank: A significant positive relationship (Type III SS = 107949812.04, F = 10.25, prob > F = .0017) was found between the average wage of male professors willingness to pay when controlling for the presence of ability to pay, organizational characteristics of size, union, growth, geographic region,
professional programs and controlling for the percentage of women.

Operational hypothesis OH(M)(2) is also supported at the associate professor rank: A significant positive relationship (Type III SS = 13197601.65, F = 3.88, prob > F = .0507) was found between the average wage of male associate professors and willingness to pay when controlling for the presence of ability to pay, organizational characteristics of size, union, growth, geographic region, professional programs and controlling for the percentage of women.

Operational hypothesis OH(M)(2) is also supported at the assistant professor rank: A significant positive relationship (Type III SS = 10922690.82, F = 4.84, prob > F = .0294) was found between average wage of male assistant professors and willingness to pay when controlling for the presence of ability to pay, organizational characteristics

Table 12

Test of Hypotheses OH(M)(1) through OH(M)(8)

GLM PROCEDURE

Dependent Variable: Average Male Salary Full Professor Rank

SOURCE	DF	SS	MS	F	PROB > F
Model	10	3696243363.18	369624336.32	35.11	0.0001
Error	149	1568760036.62	10528590.85		
Total	159	5265003399.80			
R-SQUARE = .70					

TYPE III S

SOURCE	TYPE III S		F VALUE		PROB > F
Ability to Pay	1550956545.31		147.31		0.0001
Willingness to Pay	107949812.04		10.25		0.0017
Size	341812667.54		32.47		0.0001
Unionization	47418945.43		4.50		0.0355
Growth	12082.96		0.00		0.9730
North Atlantic	53884922.04		5.12		0.0251
Great Lakes	163999.06		0.02		0.9008
Southeast	68206383.67		6.48		0.0119
Academic Mix	19149458.90		1.82		0.1795
Percentage Female	161305180.70		15.32		0.0001

PARAMETER ESTIMATES

VARIABLE		PARAMETER EST.	STD ERROR	T FOR H0: PARAM = 0	PROB > T
Intercept		41507.46	879.07	27.33	0.0001
Ability to Pay		1.07	0.09	12.14	0.0001
Willingness to Pay		844.95	267.89	3.20	0.0017
Size		6.00	1.12	5.70	0.0001
Unionization		-1483.08	732.32	-2.12	0.0355
Growth		35.19	1540.87	0.03	0.9730
North Atlantic		2059.62	960.25	2.26	0.0251
Great Lakes		-87.16	699.35	-0.12	0.9008
Southeast		1807.20	692.79	2.55	0.0119
Academic Mix		-373.49	271.86	-1.35	0.1795
Percentage Female		-204.13	51.95	-3.91	0.0001

Table 13

Test of Hypotheses OH(M)(1) through OH(M)(8)

GLM PROCEDURE

Dependent Variable: Average Male Salary Associate Professor Rank

SOURCE	DF	SS	MS	F	PROB > F
Model	10	659144243.75	65914424.38	19.38	0.0001
Error	149	506769760.02	3401139.33		
Total	159	1165914003.77			
R-SQUARE = .56					

TYPE III S

SOURCE	TYPE III S		F VALUE		PROB > F
Ability to Pay	232999010.32		68.51		0.0001
Willingness to Pay	13197601.65		3.88		0.0507
Size	63218339.38		18.59		0.0001
Unionization	276841.58		0.08		0.7758
Growth	92827.75		0.03		0.8690
North Atlantic	37613100.99		11.06		0.0011
Great Lakes	1536630.78		0.45		0.5025
Southeast	17315941.26		5.09		0.0255
Academic Mix	2940527.38		0.86		0.3540
Percentage Female	37960022.78		9.40		0.0026

PARAMETER ESTIMATES

VARIABLE		PARAMETER EST.	STD ERROR	T FOR H0: PARAM = 0	PROB > T
Intercept		32570.91	956.55	34.05	0.0001
Ability to Pay		0.41	0.05	8.28	0.0001
Willingness to Pay		294.73	149.62	1.97	0.0507
Size		2.64	0.61	4.31	0.0001
Unionization		-114.61	401.72	-0.29	0.7758
Growth		97.93	592.78	0.17	0.8690
North Atlantic		1720.13	517.25	3.33	0.0011
Great Lakes		268.55	399.54	0.67	0.5025
Southeast		906.45	401.73	2.26	0.0255
Academic Mix		-152.71	164.23	-0.93	0.3540
Percentage Female		-86.28	28.15	-3.07	0.0026

Table 14

Test of Hypotheses OH(M)(1) through OH(M)(8)

GLM PROCEDURE

Dependent Variable: Average Male Salary Assistant Professor Rank

SOURCE	DF	SS	MS	F	PROB > F
Model	10	458431267.74	45843126.77	20.30	0.0001
Error	149	336470886.50	2258193.87		
Total	159	794902154.24			
R-SQUARE = .58					

TYPE III S

SOURCE	TYPE III S		F VALUE		PROB > F
Ability to Pay	175892506.92		77.89		0.0001
Willingness to Pay	10922690.82		4.84		0.0294
Size	52838918.47		23.40		0.0001
Unionization	9822875.65		4.35		0.0387
Growth	21670.37		0.01		0.9221
North Atlantic	25106.60		0.01		0.9162
Great Lakes	187968.09		0.08		0.7734
Southeast	1688636.73		0.75		0.3886
Academic Mix	1471719.49		0.65		0.4208
Percentage Female	18526370.94		8.20		0.0048

PARAMETER ESTIMATES

VARIABLE		PARAMETER EST.	STD ERROR	T FOR H0: PARAM = 0	PROB > T
Intercept		28779.18	898.55	32.03	0.0001
Ability to Pay		0.36	0.04	8.83	0.0001
Willingness to Pay		271.09	123.26	2.20	0.0294
Size		2.36	0.49	4.84	0.0001
Unionization		-670.47	321.47	-2.09	0.0387
Growth		-47.16	481.44	-0.10	0.9221
North Atlantic		44.74	424.31	0.11	0.9162
Great Lakes		-93.25	323.22	-0.29	0.7734
Southeast		282.78	327.01	0.86	0.3886
Academic Mix		-102.71	127.23	-0.81	0.4208
Percentage Female		-48.43	16.91	-2.86	0.0048

of size, union, growth, geographic region, professional programs and controlling for the percentage of women.

Size: Operational hypothesis OH(M)(3) tests the relationship between average male wage and the organizational characteristic of size:

> OH(M)(3): There will be a significant positive ($p < .05$) relationship between average male wage and size when controlling for other independent variables.

Operational hypothesis OH(M)(3) is supported at the professor rank: A significant positive relationship (Type III SS = 341812667.54, F = 32.47, prob > F = .0001) was found between the average wage of male professors and the organizational characteristic variable size when controlling for the presence of ability to pay, other organizational characteristics of union, growth, geographic region, professional programs and controlling for the percentage of women.

Operational hypothesis OH(M)(3) is also supported at the associate professor rank: A significant positive relationship (Type III SS = 63218339.38, F = 18.59, prob > F = .0001) was found between the average wage of male associate professors and size when controlling for the presence of ability to pay, other organizational characteristics of union, growth, geographic region,

professional programs and controlling for the percentage of women.

Operational hypothesis OH(M)(3) is also supported at the assistant professor rank: A significant positive relationship (Type III SS = 52838918.44, F = 23.40, prob > F = .0001) was found between the average wage of male assistant professors and size when controlling for the presence of ability to pay, other organizational characteristics of union, growth, geographic region, professional programs and controlling for the percentage of women.

Unionization: Operational hypothesis OH(M)(4) tests the relationship between average male wage and the organizational characteristic of unionization:

> OH(M)(4): There will be a significant positive ($p < .05$) relationship between average male wage and unionization when controlling for other independent variables.

Operational hypothesis OH(M)(4) is not supported at the professor rank: A significant negative relationship instead of the positive relationship predicted (Type III SS = 47418945.43, F = 4.50, prob > F = .0355; parameter estimate = -1483.08, t = -2.12, prob > t = .0355) was found between the average wage of male professors and the organizational characteristic variable unionization when

controlling for the presence of ability to pay, other organizational characteristics of size, growth, geographic region, professional programs and controlling for the percentage of women.

Operational hypothesis OH(M)(4) is not supported at the associate professor rank: No significant relationship (Type III SS = 276841.58, F = 0.08, prob > F = .7758) was found between the average wage of male associate professors and unionization when controlling for the presence of ability to pay, other organizational characteristics of size, growth, geographic region, professional programs and controlling for the percentage of women.

Operational hypothesis OH(M)(4) is also not supported at the assistant professor rank: A significant negative relationship instead of the positive relationship predicted (Type III SS = 9822875.65, F = 4.35, prob > F = .0387; parameter estimate = -670.42, t = -2.09, prob > t = .0387) was found between the average wage of male assistant professors and unionization when controlling for the presence of ability to pay, other organizational characteristics of size, growth, geographic region, professional programs and controlling for the percentage of women.

Growth: Operational hypothesis OH(M)(5) tests the relationship between average male wage and the organizational characteristic of growth:

> OH(M)(5): There will be a significant positive ($p < .05$) relationship between average male wage and growth when controlling for other independent variables.

Operational hypothesis OH(M)(5) is not supported at the professor rank: No significant relationship (Type III SS = 12082.96, F = 0.00, prob > F = .9730) was found between the average wage of male professors and growth when controlling for the presence of ability to pay, other organizational characteristics of size, unionization, geographic region, professional programs and controlling for the percentage of women.

Operational hypothesis OH(M)(5) is also not supported at the associate professor rank: No significant relationship (Type III SS = 92827.75, F = 0.03, prob > F = .8690) was found between the average wage of male associate professors and growth when controlling for the presence of ability to pay, other organizational charactersitics of size, unionization, geographic region, professional programs and controlling for the percentage of women.

Operational hypothesis OH(M)(5) is also not supported at the assistant professor rank: No significant relationship

(Type III SS = 21670.37, F = 0.01, prob > F = .9221) was found between the average wage of male assistant professors and growth when controlling for the presence of ability to pay, other organizational characteristics of size, unionization, geographic region, professional programs and controlling for the percentage of women.

Geographic Region: Operational hypothesis OH(M)(6) tests the relationship between average male wage and the organizational characteristic of geographic region:

> OH(M)(6): There will be a significant ($p < .05$) relationship between average male wage and geographic region when controlling for other independent variables.

Operational hypothesis OH(M)(6) is supported at the professor rank. Relative to the West-Southwest region, wages in the North Atlantic region and the Southeast were significantly higher (parameter estimate = 2059.62, t = 2.26, prob > t = .0251 for North Atlantic region; parameter estimate = 1807.20, t = 2.55, prob > t = .0119 for the Southeast region) when controlling for the presence of ability to pay, other organizational characteristics of size, unionization, growth, professional programs and controlling for the percentage of women.

Operational hypothesis OH(M)(6) is also supported at the associate professor rank. Relative to the West-Southwest

region, wages in the North Atlantic region and the Southeast were significantly higher (parameter estimate = 1720.13, t = 3.33, prob > t = .0011 for North Atlantic region; parameter estimate = 906.45, t = 2.26, prob > t = .0255 for the Southeast region) when controlling for the presence of ability to pay, other organizational characteristics of size, unionization, growth, professional programs and controlling for the percentage of women.

Operational hypothesis OH(M)(6) is not supported at the assistant professor rank: There were no significant differences between average wages across any of the geographic regions when controlling for the presence of ability to pay, other organizational characteristics of size, unionization, growth, professional programs and controlling for the percentage of women.

Academic Mix: Operational hypothesis OH(M)(7) tests the relationship between average male wage and the organizational characteristic of academic mix influences on wages:

> OH(M)(7): There will be a significant positive ($p < .05$) relationship between average male wage and academic mix when controlling for other independent variables.

Operational hypothesis OH(M)(7) is not supported at the professor rank: No significant relationship (Type III SS =

19149458.90, F = 1.82, prob > F = .1795) was found between the average wage of male professors and the organizational characteristic variable number of professional programs when controlling for the presence of ability to pay, other organizational characteristics of size, unionization, growth, geographic region, and controlling for the percentage of women.

Operational hypothesis OH(M)(7) is also not supported at the associate professor rank: No significant relationship (Type III SS = 2940527.38, F = 0.86, prob > F = .6540) was found between the average wage of male associate professors and the organizational characteristic variable number of professional programs when controlling for the presence of ability to pay, other organizational characteristics of size, unionization, growth, geographic region, and controlling for the percentage of women.

Operational hypothesis OH(M)(7) is also not supported at the assistant professor rank: No significant relationship (Type III SS = 1471719.49, F = 0.65, prob > F = .4208) was found between the average wage of male assistant professors and the organizational characteristic variable number of professional programs when controlling for the presence of ability to pay, other organizational characteristics of size, unionization, growth, geographic region, and

controlling for the percentage of women.

Percentage of Women: Operational hypothesis OH(M)(8) tests the relationship between average male wage and the percentage of female faculty:

> OH(M)(8): There will not be a significant negative ($p < .05$) relationship between average male wage and percentage female when ability to pay, willingness to pay, and organizational characteristics are controlled for.

Operational hypothesis OH(M)(8) is not supported at the professor rank: A significant negative relationship (Type III SS = 161305180.70, F = 15.32, prob > F = .0001) was found between the average wage of male professors and percentage female when controlling for the presence of ability to pay, willingness to pay and the organizational characteristics of size, union, growth, geographic region and professional programs.

Operational hypothesis OH(M)(8) is also not supported at the associate professor rank: A significant negative relationship (Type III SS = 37960022.78, F = 9.40, prob > F = .0026) was found between the average wage of male associate professors and percentage female when controlling for the presence of ability to pay, willingness to pay and the organizational characteristics of size, union, growth, geographic region and professional programs.

Operational hypothesis OH(M)(8) is not supported at the assistant professor rank: A significant negative relationship (Type III SS = 18526370.94, F = 8.20, prob > F = .0048) was found between the average wage of male assistant professors and percentage female when controlling for the presence of ability to pay, willingness to pay and the organizational characteristics of size, union, growth, geographic region and professional programs.

Internal Labor Market Hypotheses

Operational hypotheses OH(M)(9) and OH(M)(10) test the relationship between ability to pay and the internal labor market. The hypotheses will be tested in the same way that they were for the general model of average wages. Results of these hypotheses are presented in Table 15 and 16.

Operational hypothesis OH(M)(9) tests whether ability and willingness to pay are more predictive of male wages at upper job levels:

> OH(M)(9): Ability to pay and willingness to pay will be more predictive of male wages at the full than associate level and at the associate than assistant level.

Operational hypothesis OH(M)(9) is partially supported. As seen in Table 15, the regression coefficients for the ability to pay and willingness to pay variables are

significant at all ranks, but they are larger at the full professor rank (parameter estimate = 1.20, t = 13.95, prob > t = .0001 for ability to pay; parameter estimate = 1001.37, t = 3.30, prob > t = .0012 for willingness to pay) than the associate professor rank (parameter estimate = 0.52, t = 11.47, prob > t =.0001 for ability to pay; parameter estimate = 418.20, t = 2.63, prob > t = .0095 for willingness to pay, and larger at the associate professor rank than the assistant professor rank (parameter estimate = .42, t = 11.31, prob > t = .0001 for ability to pay; parameter estimate = 131.85, t = 1.99, prob > t = .0485 for willingness to pay).

Tests of the R^2 values show that while ability to pay is most predictive of wages at the full level, there is no difference in the explanatory power of the models at the associate and assistant levels. The R^2 value was the largest at the full level at .56, which would be expected according to internal labor market theory. The value of .46 at the assistant level, however, was slightly higher than the value at the associate level of .45. F tests of the R^2 values show that while there is a significant difference between the values for the full rank v. the associate (F = 11.90, prob F > .05), there is no significant difference between the values at the associate and assistant ranks (F = 1.11).

Operational hypothesis OH(M)(10) tests whether ability and willingness to pay are more predictive of wages at upper job levels by determining whether there is more variance in wages at upper job levels:

> OH(M)(10): Variance in average male wage across organizations will increase from assistant to associate and from associate to full professor level.

Operational hypothesis OH(M)(10) is supported. As seen in Table 16, variance in male wages increased as predicted from the assistant to associate ranks and also from the associate to full rank. Variances were sigificantly different across ranks. The variance in male wages was the smallest at the assistant professor rank at 4,999,382. The variance increased to 7,446,485 at the associate rank and increased to 33,113,232 at the full rank. An F-test of variances at the full and associate ranks showed a significance difference in the variance of average male wages across ranks ($F = 4.45$, prob $F > .0001$). An F-test of variances at the full and assistant ranks also showed a significance difference in the variance of average male wages across ranks ($F = 6.62$, prob $F > .0001$). Also, an F-test of variances at the associate and assistant ranks showed a significance difference in the variance of average male wages across ranks ($F = 1.49$, prob $F > .0125$).

Table 15

Test of Hypotheses OH(M)(9)

Multiple Regression

Dependent Variable: Average Male Salary Full Professor Rank

F = 101.60 Prob > F = .0001

R-SQUARE = .56

PARAMETER ESTIMATES

VARIABLE		PARAMETER EST.	STD ERROR	T FOR H0: PARAM = 0	PROB > T
Intercept		42792.53	302.25	141.58	0.0001
Ability to Pay		1.20	0.09	13.95	0.0010
Willingness to Pay		1001.37	30331.0%	3.30	0.0012

Dependent Variable: Average Male Salary Associate Professor Rank

F = 68.42 Prob > F = .0001

R-SQUARE = .46

PARAMETER ESTIMATES

VARIABLE		PARAMETER EST.	STD ERROR	T FOR H0: PARAM = 0	PROB > T
Intercept		32746.17	158.69	206.35	0.0001
Ability to Pay		0.52	0.04	11.47	0.0001
Willingness to Pay		418.20	159.24	2.63	0.0095

Dependent Variable: Average Male Salary Assistant Professor Rank

F = 65.38 Prob > F = .0001

R-SQUARE = .45

PARAMETER ESTIMATES

VARIABLE		PARAMETER EST.	STD ERROR	T FOR H0: PARAM = 0	PROB > T
Intercept		28074.06	131.39	213.66	0.0001
Ability to Pay		0.42	0.04	11.31	0.0001
Willingness to Pay		262.22	131.85	1.99	0.0485

Table 16

Test of Hypothesis OH(M)(10)

COMPARISON	VARIANCE	F FOR HO: PARAM = 0	PROB > F
Average Male Salary – Full Rank to Average Male Salary – Associate Rank	33113232 7446185	4.45	0.0001
Average Male Salary – Full Rank to Average Male Salary – Assistant Rank	33113232 4999382	6.62	0.0001
Average Male Salary – Associate Rank to Average Male Salary – Assistant Rank	7446185 4999382	1.49	0.0125

The next section will discuss results of operational hypotheses testing the model of average female wages.

A MODEL OF AVERAGE FEMALE WAGES

The model of average female wages developed in the previous chapters proposed that average female wages across organizations were determined by ability to pay, willingness to pay, organizational characteristics, and the working of the internal labor market across job levels.

Operational hypotheses OH(F)1 through OH(F)8 were tested in the same manner as in the general model of average wages, using multiple regression analysis and the GLM technique. The hypotheses being examined here test the relationship between the dependent variable, average female wage, and independent variables ability to pay, willingness to pay, each organizational characteristic variable, and percentage of women in the organization. Results of operational hypotheses investigating the determinants of average female wages are presented below for tests of the model at each job level and summarized in Table 17 for average female salary at the professor rank, Table 18 for average female salary at the associate professor rank, and Table 19 for the assistant professor rank.

Ability to Pay: Operational hypothesis OH(F)(1) tests the

relationship between average female wage and ability to pay:

> OH(F)(1): There will be a significant positive ($p < .05$) relationship between average female wage and ability to pay when controlling for other independent variables.

Operational hypothesis OH(F)(1) is supported at the professor rank: A significant positive relationship (Type III SS = 1054011810.44, F = 95.35, prob > F = .0001) was found between average wage of female professors and ability to pay when controlling for the presence of willingness to pay, organizational characteristics of size, union, growth, geographic region, professional programs and controlling for the percentage of women (see Table 17).

Operational hypothesis OH(F)(1) is also supported at the associate professor rank. A significant positive relationship (Type III SS = 278329110.01, F = 73.44, prob > F = .0001) was found between average wage of female associate professors and ability to pay when controlling for the presence of willingness to pay, organizational characteristics of size, union, growth, geographic region, professional programs and controlling for the percentage of women (see Table 18).

Operational hypothesis OH(F)(1) is also supported at the assistant professor rank. A significant positive

Table 17

Test of Hypotheses OH(F)(1) through OH(F)(8)

GLM PROCEDURE

Dependent Variable: Average Female Salary Full Professor Rank

SOURCE	DF	SS	MS	F	PROB > F
Model	10	2332917020.10	233291702.01	21.10	0.0001
Error	149	1647144236.06	11054659.30		
Total	159	3980061256.16			
R-SQUARE = .59					

TYPE III S

SOURCE	TYPE III S		F VALUE		PROB > F
Ability to Pay	1054011810.44		95.35		0.0001
Willingness to Pay	49096347.61		4.44		0.0368
Size	191835574.74		17.35		0.0001
Unionization	10291788.71		0.93		0.3362
Growth	11772777.74		1.06		0.3038
North Atlantic	25648242.44		2.32		0.1298
Great Lakes	3009530.03		0.27		0.6026
Southeast	14728736.05		1.33		0.2502
Academic Mix	33704341.14		3.05		0.0829
Percentage Female	55378033.53		4.83		0.0295

PARAMETER ESTIMATES

VARIABLE		PARAMETER EST.	STD ERROR	T FOR H0: PARAM = 0	PROB > T
Intercept		35868.23	1512.01	24.38	0.0001
Ability to Pay		0.88	0.09	9.76	0.0001
Willingness to Pay		567.68	269.37	2.11	0.0368
Size		4.51	1.08	4.17	0.0001
Unionization		-691.18	716.34	-0.96	0.3362
Growth		1102.35	1068.2	1.03	0.3038
North Atlantic		1417.85	930.84	1.52	0.1298
Great Lakes		-373.27	715.39	-0.52	0.6026
Southeast		838.72	726.62	1.15	0.2502
Academic Mix		-497.38	284.85	-1.75	0.0829
Percentage Female		-117.43	53.44	-2.20	0.0295

Table 18

Test of Hypotheses OH(F)(1) through OH(F)(8)

GLM PROCEDURE

Dependent Variable: Average Female Salary Associate Professor Rank

SOURCE	DF	SS	MS	F	PROB > F
Model	10	636053827.47	63605382.75	16.78	0.0001
Error	149	564694861.45	3789898.40		
Total	159	1200748688.92			
R-SQUARE = .53					

TYPE III S

SOURCE	TYPE III S		F VALUE		PROB > F
Ability to Pay	278329110.01		73.44		0.0001
Willingness to Pay	21717624.46		5.73		0.0179
Size	38865311.71		10.25		0.0017
Unionization	989.59		0.00		0.9871
Growth	629419.53		0.17		0.6842
North Atlantic	11252378.39		2.97		0.0869
Great Lakes	418888.16		0.11		0.7400
Southeast	3516927.00		0.93		0.3370
Academic Mix	11117107.69		2.93		0.0888
Percentage Female	28622333.99		7.55		0.0067

PARAMETER ESTIMATES

VARIABLE		PARAMETER EST.	STD ERROR	T FOR H0: PARAM = 0	PROB > T
Intercept		31212.16	1012.72	30.82	0.0001
Ability to Pay		0.45	0.05	8.57	0.0001
Willingness to Pay		378.89	158.28	2.39	0.0179
Size		2.03	0.63	3.20	0.0017
Unionization		6.81	421.95	0.02	0.9871
Growth		253.59	622.26	0.41	0.6842
North Atlantic		940.7	545.94	1.72	0.0869
Great Lakes		-139.48	419.55	-0.33	0.7400
Southeast		406.87	422.37	0.96	0.3370
Academic Mix		-286.03	167.00	-1.71	0.0888
Percentage Female		-76.83	27.96	-2.75	0.0067

Table 19

Test of Hypotheses OH(F)(1) through OH(F)(8)

GLM PROCEDURE

Dependent Variable: Average Female Salary Assistant Professor Rank

SOURCE	DF	SS	MS	F	PROB > F
Model	10	347503518.30	34750351.83	18.17	0.0001
Error	149	285013644.46	1912843.25		
Total	159	632517162.76			
R-SQUARE = .55					

TYPE III S

SOURCE	TYPE III S		F VALUE		PROB > F
Ability to Pay	156028469.12		81.57		0.0001
Willingness to Pay	2027801.10		1.06		0.3049
Size	26793946.15		14.01		0.0003
Unionization	285787.72		0.15		0.6997
Growth	621558.73		0.32		0.5695
North Atlantic	6398448.64		3.34		0.0694
Great Lakes	5480125.01		2.86		0.0926
Southeast	71902.77		0.04		0.8465
Academic Mix	4870371.49		2.55		0.1127
Percentage Female	8161309.28		4.27		0.0406

PARAMETER ESTIMATES

VARIABLE		PARAMETER EST.	STD ERROR	T FOR H0: PARAM = 0	PROB > T
Intercept		27012.15	847.48	31.87	0.0001
Ability to Pay		0.34	0.04	9.03	0.0001
Willingness to Pay		116.45	113.10	1.03	0.3049
Size		1.70	0.45	3.74	0.0003
Unionization		-114.06	295.09	-0.39	0.6997
Growth		-255.64	448.47	-0.57	0.5695
North Atlantic		-712.16	389.39	-1.83	0.0694
Great Lakes		-502.51	296.88	-1.69	0.0926
Southeast		-58.30	300.69	-0.19	0.8465
Academic Mix		-191.06	119.74	-1.60	0.1127
Percentage Female		-33.16	16.06	-2.07	0.0406

relationship (Type III SS = 156028469.12, F = 81.57, prob > F = .0001) was found between average wage of female assistant professors and ability to pay when controlling for the presence of willingness to pay, organizational characteristics of size, union, growth, geographic region, professional programs and controlling for the percentage of women (see Table 19).

Willingness to Pay: Operational hypothesis OH(F)(2) tests the relationship between average female wage and willingness to pay:

> OH(F)(2): There will be a significant positive ($p < .05$) relationship between average female wage and willingness to pay when controlling for other independent variables.

Operational hypothesis OH(F)(2) is supported at the professor rank: A significant positive relationship (Type III SS = 49096347.61, F = 4.44, prob > F = .0368) was found between the average wage of female professors willingness to pay when controlling for the presence of ability to pay, organizational characteristics of size, union, growth, geographic region, professional programs and controlling for the percentage of women.

Operational hypothesis OH(F)(2) is also supported at the associate professor rank: A significant positive relationship (Type III SS = 21717624.46, F = 5.73, prob > F

= .0179) was found between the average wage of female associate professors and willingness to pay when controlling for the presence of ability to pay, organizational characteristics of size, union, growth, geographic region, professional programs and controlling for the percentage of women.

Operational hypothesis OH(F)(2) is not supported at the assistant professor rank: No significant relationship (Type III SS = 2027801.10, F =1.06, prob > F = .3049) was found between average wage of female assistant professors and willingness to pay when controlling for the presence of ability to pay, organizational characteristics of size, union, growth, geographic region, professional programs and controlling for the percentage of women.

Size: Operational hypothesis OH(F)(3) tests the relationship between average female wage and the organizational characteristic of size:

> OH(F)(3): There will be a significant positive ($p < .05$) relationship between average female wage and size when controlling for other independent variables.

Operational hypothesis OH(F)(3) is supported at the professor rank: A significant positive relationship (Type III SS = 191835574.74, F = 17.35, prob > F = .0001) was found between the average wage of female professors and the

organizational characteristic variable size when controlling for the presence of ability to pay, other organizational characteristics of union, growth, geographic region, professional programs and controlling for the percentage of women.

Operational hypothesis OH(F)(3) is also supported at the associate professor rank: A significant positive relationship (Type III SS = 38865311.71, F = 10.25, prob > F = .0001) was found between the average wage of female associate professors and size when controlling for the presence of ability to pay, other organizational characteristics of union, growth, geographic region, professional programs and controlling for the percentage of women.

Operational hypothesis OH(F)(3) is also supported at the assistant professor rank: A significant positive relationship (Type III SS = 26793946.15, F = 14.01, prob > F = .0003) was found between the average wage of female assistant professors and size when controlling for the presence of ability to pay, other organizational characteristics of union, growth, geographic region, professional programs and controlling for the percentage of women.

Unionization: Operational hypothesis OH(F)(4) tests the relationship between average female wage and the organizational characteristic of unionization:

> OH(F)(4): There will be a significant positive ($p < .05$) relationship between average female wage and unionization when controlling for other independent variables.

Operational hypothesis OH(F)(4) is not supported at the professor rank: No significant relationship (Type III SS = 10291788.71, F = 0.93, prob > F = .3362) was found between the average wage of female professors and the organizational characteristic variable unionization when controlling for the presence of ability to pay, other organizational characteristics of size, growth, geographic region, professional programs and controlling for the percentage of women.

Operational hypothesis OH(F)(4) is also not supported at the associate professor rank: No significant relationship (Type III SS = 989.59, F = 0.00, prob > F = .9871) was found between the average wage of female associate professors and unionization when controlling for the presence of ability to pay, other organizational characteristics of size, growth, geographic region, professional programs and controlling for the percentage of women.

Operational hypothesis OH(F)(4) is also not supported at the assistant professor rank: No significant relationship (Type III SS = 285787.72, F = 0.15, prob > F = .6997) was found between the average wage of female assistant professors and unionization when controlling for the presence of ability to pay, other organizational characteristics of size, growth, geographic region, professional programs and controlling for the percentage of women.

Growth: Operational hypothesis OH(F)(5) tests the relationship between average female wage and the organizational characteristic of growth:

> OH(F)(5): There will be a significant positive ($p < .05$) relationship between average female wage and growth when controlling for other independent variables.

Operational hypothesis OH(F)(5) is not supported at the professor rank: No significant relationship (Type III SS = 11772777.74, F = 1.06, prob > F = .3038) was found between the average wage of female professors and growth when controlling for the presence of ability to pay, other organizational characteristics of size, unionization, geographic region, professional programs and controlling for the percentage of women.

Operational hypothesis OH(F)(5) is also not supported at

the associate professor rank: No significant relationship (Type III SS = 629419.53, F = 0.17, prob > F = .6842) was found between the average wage of female associate professors and growth when controlling for the presence of ability to pay, other organizational characteristics of size, unionization, geographic region, professional programs and controlling for the percentage of women.

Operational hypothesis OH(F)(5) is also not supported at the assistant professor rank: No significant relationship (Type III SS = 621558.73, F = 0.32 prob > F = .5695) was found between the average wage of female assistant professors and growth when controlling for the presence of ability to pay, other organizational characteristics of size, unionization, geographic region, professional programs and controlling for the percentage of women.

Geographic Region: Operational hypothesis OH(F)(6) tests the relationship between average female wage and the organizational characteristic of geographic region:

> OH(F)(6): There will be a significant ($p < .05$) relationship between average female wage and geographic region when controlling for other independent variables.

Operational hypothesis OH(F)(6) is not supported at the professor rank. There were no significant differences between average wages across any of the geographic regions

when controlling for the presence of ability to pay, other organizational characteristics of size, unionization, growth, professional programs and controlling for the percentage of women.

Operational hypothesis OH(F)(6) is also not supported at the associate rank. Again, there were no significant differences between average wages across any of the geographic regions when controlling for the presence of ability to pay, other organizational characteristics of size, unionization, growth, professional programs and controlling for the percentage of women.

Operational hypothesis OH(F)(6) is also not supported at the assistant professor rank: There were no significant differences between average wages across any of the geographic regions when controlling for the presence of ability to pay, other organizational characteristics of size, unionization, growth, professional programs and controlling for the percentage of women.

Academic Mix: Operational hypothesis OH(F)(7) tests the relationship between average female wage and the organizational characteristic of academic mix influences on wages:

OH(F)(7): There will be a significant positive ($p <$

.05) relationship between average female wage and academic mix when controlling for other independent variables.

Operational hypothesis OH(F)(7) is not supported at the professor rank: No significant relationship (Type III SS = 33704341.14, F = 3.05, prob > F = .0829) was found between the average wage of female professors and the organizational characteristic variable number of professional programs when controlling for the presence of ability to pay, other organizational characteristics of size, unionization, growth, geographic region, and controlling for the percentage of women.

Operational hypothesis OH(F)(7) is also not supported at the associate professor rank: No significant relationship (Type III SS = 11117107.69, F = 2.93, prob > F = .0888) was found between the average wage of female associate professors and the organizational characteristic variable number of professional programs when controlling for the presence of ability to pay, other organizational characteristics of size, unionization, growth, geographic region, and controlling for the percentage of women.

Operational hypothesis OH(F)(7) is also not supported at the assistant professor rank: No significant relationship (Type III SS = 4870371.49, F = 2.55, prob > F = .1127) was found between the average wage of female assistant

professors and the organizational characteristic variable number of professional programs when controlling for the presence of ability to pay, other organizational characteristics of size, unionization, growth, geographic region, and controlling for the percentage of women.

Percentage of Women: Operational hypothesis OH(F)(8) tests the relationship between average female wage and the percentage of female faculty:

> OH(F)(8): There will not be a significant negative ($p < .05$) relationship between average female wage and percentage female when ability to pay, willingness to pay, and organizational characteristics are controlled for.

Operational hypothesis OH(F)(8) is not supported at the professor rank: A significant negative relationship (Type III SS = 55378033.53, F = 4.83, prob > F = .0295) was found between the average wage of female professors and percentage female when controlling for the presence of ability to pay, willingness to pay and the organizational characteristics of size, union, growth, geographic region and professional programs.

Operational hypothesis OH(F)(8) is also not supported at the associate professor rank: A significant negative relationship (Type III SS = 28622333.99, F = 7.55, prob > F = .0067) was found between the average wage of female

associate professors and percentage female when controlling for the presence of ability to pay, willingness to pay and the organizational characteristics of size, union, growth, geographic region and professional programs.

Operational hypothesis OH(F)(8) is not supported at the assistant professor rank: A significant negative relationship (Type III SS = 8161309.28, F = 4.27, prob > F = .0406) was found between the average wage of female assistant professors and percentage female when controlling for the presence of ability to pay, willingness to pay and the organizational characteristics of size, union, growth, geographic region and professional programs.

Internal Labor Market Hypotheses

Operational hypotheses OH(F)(9) and OH(F)(10) test the relationship between ability to pay and the internal labor market. The hypotheses will be tested in the same way that they were for the general model of average wages. Results of these hypotheses are presented in Tables 20 and 21.

Operational hypothesis OH(F)(9) tests whether ability and willingness to pay are more predictive of female wages at upper job levels:

OH(F)(9): Ability to pay and willingness to pay will

be more predictive of female wages at the full than associate level and at the associate than assistant level.

Operational hypothesis OH(F)(9) received partial support. The regression coefficients for ability to pay are significant at all ranks, and the coefficients for the willingness to pay variable are significant at the full professor and associate ranks. Both ability to pay and willingness to pay coefficients are larger at the full professor rank (parameter estimate = 0.99, t = 12.29, prob > t = .0001 for ability to pay; parameter estimate = 696.49, t = 2.45, prob > t = .0154 for willingness to pay) than the associate professor rank (parameter estimate = .52, t = 11.43, prob > t = .0001 for ability to pay; parameter estimate = 434.17, t = 2.71, prob > t = .0076 for willingness to pay, and at the associate than the assistant professor rank (parameter estimate = .40, t = 12.18, prob > t = .0001 for ability to pay; parameter estimate = 102.54, t = .88, prob > t = .3805 for willingness to pay) (see Table 20).

Tests of the R^2 values show that while ability to pay is most predictive of wages at the full level, there is no significant difference in the explanatory power of the models across ranks. The R^2 value was the largest at the full level at .50, which would be expected according to internal labor market theory. The value of .49 at the assistant level, however, was higher than the value at the

associate level of .46. F tests of the R^2 values show that there is no significant difference between the values for the full rank v. the associate (F = 4.44), or the full v. the assistant ranks (F = 1.11).

Operational hypothesis OH(F)(10) tests whether ability and willingness to pay are more predictive of wages at upper job levels by determining whether there is more variance in wages at upper job levels:

> OH(F)(10): Variance in average female wage across organizations will increase from assistant to associate and from associate to full professor level.

Operational hypothesis OH(F)(10) is supported. As seen in Table 21, variance in female wages increased as predicted from the assistant to associate ranks and also from the associate to full rank. Variances were sigificantly different across ranks. The variance in female wages was the smallest at the assistant professor rank at 4,147,698. The variance increased to 7,551,888 at the associate rank and increased to 25,250,223 at the full rank. An F-test of variances at the full and associate ranks showed a significance difference in the variance of average female wages across ranks (F = 3.34, prob F > .0001). An F-test of variances at the full and assistant ranks also showed a significance difference in the variance of average female wages across ranks (F = 6.09, prob F > .0001). Also, an F-

Table 20

Test of Hypotheses OH(F)(9)

Multiple Regression

Dependent Variable: Average Female Salary Full Professor Rank

F = 77.75 Prob > F = .0001

R-SQUARE = .50

PARAMETER ESTIMATES

VARIABLE		PARAMETER EST.	STD ERROR	T FOR H0: PARAM = 0	PROB > T
Intercept		39222.59	283.36	138.42	0.0001
Ability to Pay		0.99	0.08	12.29	0.0010
Willingness to Pay		696.49	284.36	2.45	0.0154

Dependent Variable: Average Female Salary Associate Professor Rank

F = 68.21 Prob > F = .0001

R-SQUARE = .46

PARAMETER ESTIMATES

VARIABLE		PARAMETER EST.	STD ERROR	T FOR H0: PARAM = 0	PROB > T
Intercept		30819.81	159.92	192.71	0.0001
Ability to Pay		0.52	0.04	11.43	0.0001
Willingness to Pay		434.17	160.48	2.71	0.0076

Dependent Variable: Average Female Salary Assistant Professor Rank

F = 74.30 Prob > F = .0001

R-SQUARE = .49

PARAMETER ESTIMATES

VARIABLE		PARAMETER EST.	STD ERROR	T FOR H0: PARAM = 0	PROB > T
Intercept		25752.99	116.13	221.75	0.0001
Ability to Pay		0.40	0.03	12.18	0.0001
Willingness to Pay		102.50	116.54	0.88	0.3805

Table 21

Test of Hypothesis OH(F)(10)

COMPARISON	VARIANCE	F FOR HO: PARAM = 0	PROB > F
Average Female Salary – Full Rank to Average Female Salary – Associate Rank	25250223 7551888	3.34	0.0001
Average Female Salary – Full Rank to Average Female Salary – Assistant Rank	25250223 4147698	6.09	0.0001
Average Female Salary – Associate Rank to Average Female Salary – Assistant Rank	7551888 4147698	1.82	0.0001

test of variances at the associate and assistant ranks showed a significance difference in the variance of average female wages across ranks ($F = 1.82$, prob $F > .0001$).

Comparison of Male and Female Models

Operational hypotheses OH(C)(1) and OH(C)(2) test whether the male and female models of average wages are equally predictive of wage levels overall at each job level, and whether variables that are predictive of the average wages of men are predictive of the average wages of women. The results of these hypotheses are presented in Table 22.

Operational hypothesis OH(C)(1) tests whether the overall models of male and female average wages are equally predictive:

> OH(C)(1): The male and female models of average wages will be equally predictive of wages.

Operational hypothesis OH(C)(2) tests whether variables in the models of male and female average wages are equally predictive:

> OH(C)(2): Independent variables which are predictive of wages in the male model will be equally predictive of wages in the female model.

Operational hypotheses OH(C)(1) and OH(C)(2) are not supported. There is a significant difference between the regression equations for average male salary and average female salary at each rank (F = 2.43, prob F > .01, full professor rank; F = 4.67, prob F >.01, associate professor rank; and F = 5.50, prob F > .0, assistant professor rank) indicating that the regression coefficients are not equal across male and female equations and that the equations are not equivalant (see Table 22).

The next section will discuss results of operational hypotheses testing the model of gender-related wage differentials.

MODEL OF GENDER-RELATED WAGE DIFFERENTIALS

The model of gender-related wage differentials examines whether women's lower wages are due to their segmentation and retention in organizations at the low end of a wage hierarchy. Operational hypotheses of this model (OH(D)(1), OH(D)(2a and b), OH(D)(3a and b), and OH(D)(4a and b)) test whether women are segmented into lower ability to pay organizations and whether there is a significant difference in the wages of men and women in low ability to pay organizations compared to those in high ability to pay organizations. Results of tests of these hypotheses are presented in Tables 23, 24, 25, 26, 27, and 28.

Table 22

Test of Hypotheses OH(C)(1) and OH(C)(2)

Test of Equality of Female Regression Equations

Full Professor Rank

F = 2.43, prob F > 0.01

Associate Professor Rank

F = 4.67, prob F > 0.01

Associate Professor Rank

F = 5.50, prob F > 0.01

Operational hypothesis OH(D)(1) tests whether women are segregated into lower ability to pay organizations:

> OH(D)(1): The increase in percentage female is significantly less ($p < .05$) in higher ability to pay than lower ability to pay organizations at each rank.

Operational hypothesis OH(D)(1) is not supported at the full rank. As indicated in Table 23, the growth in percentage female was greater in high ability to pay schools, however the increase was not significantly different from that at low ability to pay schools. A t-test of the difference in means shows no significant difference in the increase in the percentage of women between high and low ability to pay schools (High ATP: Mean growth rate = 3.97, Low ATP: Mean growth rate = 3.62, t = -0.56, prob > t = .5778).

Operational hypothesis OH(D)(1) is also not supported at the associate rank. Growth in percentage female is again greater in the high ability to pay schools than low, but the increase is not significantly different from that at low ability to pay schools (High ATP: Mean growth rate = 4.71, Low ATP: Mean growth rate = 4.03,t = -1.98, prob > t = .0649). For both high and low ability to pay schools, the increase in percentage female is greatest at this rank.

Table 23

Test of Hypotheses OH(D)(1)

T-Test

Variable: Increase in Percentage Female Full Professor Rank

ABILITY TO PAY	N	MEAN	STD DEV	MIN	MAX
High	80	3.97	4.21	0.36	26.31
Low	80	3.62	3.45	-0.13	23.17

t = -0.56
prob > t = .5778

Variable: Increase in Percentage Female Associate Professor Rank

ABILITY TO PAY	N	MEAN	STD DEV	MIN	MAX
High	80	4.71	2.08	1.58	9.98
Low	80	4.03	2.24	0.71	13.41

t = -1.98
prob > t = .0649

Variable: Increase in Percentage Female Assistant Professor Rank

ABILITY TO PAY	N	MEAN	STD DEV	MIN	MAX
High	80	3.28	1.24	0.82	7.10
Low	80	2.91	1.27	0.66	7.31

t = -1.778
prob > t = .0762

Operational hypothesis OH(D)(1) is also not supported at the assistant rank. Growth in percentage female is again greater in the high ability to pay schools than low, but again, the increase is not significantly different from that at low ability to pay schools (High ATP: Mean growth rate = 3.28, Low ATP: Mean growth rate = 2.91, t = -1.78, prob > t = .0762).

Operational hypotheses OH(D)(2a and b) test whether the average wages of men and women are equal within both high and low ability to pay organizations at each rank:

> OH(D)(2a): There will be no significant ($p < .05$) difference between average male and average female wages within high ability to pay organizations at each rank.
>
> OH(D)(2b): There will be no significant ($p < .05$) difference between average male and average female wages within low ability to pay organizations at each rank.

Operational hypotheses OH(D)(2a and b) are not supported at the full rank. As shown in Table 24, there is a significant difference between the average wages of men and women within high ability to pay schools (difference = 4146.1, p = .05) and within low ability to pay schools (difference = 2993.8, p = .05).

Operational hypotheses OH(D)(2a and b) are also not

Table 24

Test of Operational Hypotheses OH(D)(2a and b)

ANOVA Results

Tukey's Multiple Comparison Test OH(D)(2a)

Variable: Average Salary Full Rank, High Ability to Pay Group

Alpha = .05
Critical Value = 3.654
Minimum Significant Difference = 1433.6

Male to Female Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit	Significant Comparison
M - F	2712.50	4146.1	5579.7	*

Tukey's Multiple Comparison Test OH(D)(2b)

Variable: Average Salary Full Rank, Low Ability to Pay Group

Alpha = .05
Critical Value = 3.653
Minimum Significant Difference = 1433.6

Male to Female Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit	Significant Comparison
M - F	1560.20	2993.8	4427.4	*

* Comparisons significant at the .05 level.

Table 25

Test of Operational Hypotheses OH(D)(2a and b)

ANOVA Results

Tukey's Multiple Comparison Test OH(D)(2a)

Variable: Average Salary Associate Rank, High Ability to Pay Group

Alpha = .05
Critical Value = 3.653
Minimum Significant Difference = 731.29

Male to Female Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit	Significant Comparison
M - F	1214.30	1945.6	2676.9	*

Tukey's Multiple Comparison Test OH(D)(2b)

Variable: Average Salary Associate Rank, Low Ability to Pay Group

Alpha = .05
Critical Value = 3.653
Minimum Significant Difference = 731.29

Male to Female Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit	Significant Comparison
M - F	1175.90	1907.2	2638.4	*

* Comparisons significant at the .05 level.

Table 26

Test of Operational Hypotheses OH(D)(2a and b)

ANOVA Results

Tukey's Multiple Comparison Test OH(D)(2a)

Variable: Average Salary Assistant Rank, High Ability to Pay Group

Alpha = .05
Critical Value = 3.653
Minimum Significant Difference = 371.96

Male to Female Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit	Significant Comparison
M - F	1999.80	2371.8	2743.8	*

Tukey's Multiple Comparison Test OH(D)(2b)

Variable: Average Salary Assistant Rank, Low Ability to Pay Group

Alpha = .05
Critical Value = 3.653
Minimum Significant Difference = 371.96

Male to Female Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit	Significant Comparison
M - F	1898.40	2270.3	2642.3	*

* Comparisons significant at the .05 level.

supported at the associate rank. As indicated in Table 25, there is a significant difference between the average wages of men and women within high ability to pay schools (difference = 1945.6, p = .05) and within low ability to pay schools (difference = 1907.2, p = .05).

Operational hypotheses OH(D)(2a and b) are also not supported at the assistant rank. Again, there is a significant difference between the average wages of men and women within high ability to pay schools (difference = 2743.8, p = .05) and within low ability to pay schools (difference = 2270.3, p = .05) (see Table 26).

Operational hypotheses OH(D)(3a and b) test whether organizations accept labor market wage rates at entry level positions by testing whether the wages of men and women are significantly different across high and low ability to pay organizations:

> OH(D)(3a): There will be no significant ($p < .05$) difference between average male wages across high and low ability to pay organizations at the assistant professor rank.
>
> OH(D)(3b): There will be no significant ($p < .05$) difference between average female wages across high and low ability to pay organizations at the assistant professor rank.

Operational hypotheses OH(D)(3a and b) are not supported. For both males and females, the difference in average wage

across high and low ability to pay schools was a significant one (Males: difference high to low ability to pay = 2234.1, p = .05; Females: difference high to low ability to pay = 2132.6, p = .05) (see Table 27).

Operational hypotheses OH(D)(4a and b) test whether ability to pay and the internal labor market influence wages at upper level positions by testing whether the wages of men and women are significantly different across high and low ability to pay organizations at the associate and full ranks:

> OH(D)(4a): There will be a significant ($p < .05$) difference between average male wages across high and low ability to pay organizations at the associate and full professor ranks.
>
> OH(D)(4b): There will be a significant ($p < .05$) difference between average female wages across high and low ability to pay organizations at the associate and full professor ranks.

Operational hypothesis OH(D)(4a) is supported at both the associate and full ranks. As indicated in Table 28, at the full rank, the difference in male average wage across high and low ability to pay schools is significant (difference = 5798.9, p = .05). At the associate rank, the difference in male average wage across high and low ability to pay schools is also significant (difference = 2618.4, p = .05). The difference in average male salaries across high and low

Table 27

Test of Operational Hypotheses OH(D)(3a and b)

ANOVA Results

Tukey's Multiple Comparison Test OH(D)(3a)

Variable: Average Male Salary Assistant Rank

Alpha = .05
Critical Value = 3.653
Minimum Significant Difference = 371.96

Male High ATP to Male Low ATP Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit	Significant Comparison
M - M	1862.10	2234.1	2606.0	*

Tukey's Multiple Comparison Test OH(D)(3b)

Variable: Average Female Salary Assistant Rank

Alpha = .05
Critical Value = 3.653
Minimum Significant Difference = 371.96

Female High ATP to Female Low ATP Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit	Significant Comparison
F - F	1760.60	2132.6	2504.6	*

* Comparisons significant at the .05 level.

Table 28

Test of Operational Hypotheses OH(D)(4a and b)

Tukey's Multiple Comparison Test OH(D)(4a)

Variable: Average Male Salary Full Rank

Alpha = .05
Critical Value = 3.653
Minimum Significant Difference = 1433.6

Male High ATP to Male Low ATP Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit	Significant Comparison
M – M	4365.30	5798.9	7232.5	*

Tukey's Multiple Comparison Test OH(D)(4a)

Variable: Average Male Salary Associate Rank

Alpha = .05
Critical Value = 3.653
Minimum Significant Difference = 731.29

Male High ATP to Male Low ATP Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit	Significant Comparison
M – M	1887.10	2618.4	3349.7	*

Tukey's Multiple Comparison Test OH(D)(4b)

Variable: Average Female Salary Full Rank

Alpha = .05
Critical Value = 3.653
Minimum Significant Difference = 1433.6

Female High ATP to Female Low ATP Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit	Significant Comparison
F – F	3212.90	4646.5	6080.1	*

Tukey's Multiple Comparison Test OH(D)(4b)

Variable: Average Female Salary Associate Rank

Alpha = .05
Critical Value = 3.653
Minimum Significant Difference = 731.29

Female High ATP to Female Low ATP Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit	Significant Comparison
F – F	1848.70	2580.0	3311.3	*

* Comparisons significant at the .05 level.

ability to pay schools is less at the associate rank than full.

Operational hypothesis OH(D)(4b) is also supported at both the associate and full ranks for the average wages of females. At the full rank, the difference in female average wage across high and low ability to pay schools is significant (difference = 4646.5, p = .05). At the associate rank, the difference in female average wage across high and low ability to pay schools is also significant (difference = 2580.0, p = .05). The difference in average female salaries across high and low ability to pay schools is also less at the associate rank than full.

SUMMARY

The findings presented in this chapter are summarized in Table 29. Findings are summarized for the overall model of average wages, the model of male average wages, the model of female average wages, the comparison of the male and female models, and the model of the gender-related wage differential.

Overall results indicate that ability to pay had a positive significant effect on overall wages and wages for both men and women at all ranks of full, associate and assistant professors.

Willingness to pay also had a positive significant

Table 29

Summary of Findings

ITEM	OH	FINDING	RELATION	TABLE
Test for Segregation				
% Female / Average Salary	OH(S)(1a)	Support	t = -3.37	6
% Female / Average Male Salary	OH(S)(1b)	Support	t = -3.12	6
% Female / Average Female Salary	OH(S)(1c)	Support	t = -2.79	6
Model: (A) Average Wages				
Dependent Variable: Avg. Salary Full Professor Rank				
Independent Variables:				
Ability to Pay	OH(A)(1)	Support	F = 149.31	7
Willingness to Pay	OH(A)(2)	Support	F = 10.10	7
Size	OH(A)(3)	Support	F = 32.73	7
Unionization	OH(A)(4)	No Support	F = 4.35	7
Growth	OH(A)(5)	No Support	F = .01	7
Geographic Location	OH(A)(6)	Support	F = 5.11	7
			F = 6.43	
Academic Mix	OH(A)(7)	No Support	F = 2.16	7
Percentage Female	OH(A)(8)	No Support	F = 18.91	7
Model: (A) Average Wages				
Dependent Variable: Avg. Salary Associate Professor Rank				
Independent Variables:				
Ability to Pay	OH(A)(1)	Support	F = 82.43	8
Willingness to Pay	OH(A)(2)	Support	F = 5.55	8
Size	OH(A)(3)	Support	F = 19.88	8
Unionization	OH(A)(4)	No Support	F = 0.14	8
Growth	OH(A)(5)	No Support	F = 0.12	8
Geographic Location	OH(A)(6)	Support	F = 7.96	8
			F = 4.00	
Academic Mix	OH(A)(7)	No Support	F = 3.57	8
Percentage Female	OH(A)(8)	No Support	F = 13.95	8

Table 29
(con't)
Summary of Findings

ITEM	OH	FINDING	RELATION	TABLE
Model: (A) Average Wages				
Dependent Variable: Avg. Salary Assistant Professor Rank				
Independent Variables:				
Ability to Pay	OH(A)(1)	Support	F = 93.40	9
Willingness to Pay	OH(A)(2)	Support	F = 3.83	9
Size	OH(A)(3)	Support	F = 26.02	9
Unionization	OH(A)(4)	No Support	F = 3.21	9
Growth	OH(A)(5)	No Support	F = 0.02	9
Geographic Location	OH(A)(6)	No Support		9
Academic Mix	OH(A)(7)	No Support	F = 1.65	9
Percentage Female	OH(A)(8)	No Support	F = 16.06	9
Model: (A) Average Wages				
Test of Internal Labor				
ILM Influence	OH(A)(9)	Partial Support	F = 10.00	10
			F = 2.08	
Equal Variance	OH(A)(10)	Support	F = 4.42	11
			F = 6.98	11
			F = 1.58	11
Model: (M) Average Male Wages				
Dependent Variable: Avg. Male Salary Full Professor Rank				
Independent Variables:				
Ability to Pay	OH(M)(1)	Support	F = 147.31	12
Willingness to Pay	OH(M)(2)	Support	F = 10.25	12
Size	OH(M)(3)	Support	F = 32.47	12
Unionization	OH(M)(4)	No Support	F = 4.50	12
Growth	OH(M)(5)	No Support	F = 0.00	12
Geographic Location	OH(M)(6)	Support	F = 5.12	12
			F = 6.48	
Academic Mix	OH(M)(7)	No Support	F = 1.82	12
Percentage Female	OH(M)(8)	No Support	F = 15.32	12

Table 29
(con't)
Summary of Findings

ITEM	OH	FINDING	RELATION	TABLE
Model: (M) Average Male Wages				
Dependent Variable: Avg. Male Salary Associate Professor Rank				
Independent Variables:				
Ability to Pay	OH(M)(1)	Support	F = 68.51	13
Willingness to Pay	OH(M)(2)	Support	F = 3.88	13
Size	OH(M)(3)	Support	F = 18.59	13
Unionization	OH(M)(4)	No Support	F = 0.08	13
Growth	OH(M)(5)	No Support	F = 0.03	13
Geographic Location	OH(M)(6)	Support	F = 11.06	13
			F = 5.09	
Academic Mix	OH(M)(7)	No Support	F = 0.86	13
Percentage Female	OH(M)(8)	No Support	F = 9.40	13
Model: (M) Average Male Wages				
Dependent Variable: Avg. Male Salary Assistant Professor Rank				
Independent Variables:				
Ability to Pay	OH(M)(1)	Support	F = 77.89	14
Willingness to Pay	OH(M)(2)	Support	F = 4.84	14
Size	OH(M)(3)	Support	F = 23.40	14
Unionization	OH(M)(4)	No Support	F = 4.35	14
Growth	OH(M)(5)	No Support	F = 0.01	14
Geographic Location	OH(M)(6)	No Support		14
Academic Mix	OH(M)(7)	No Support	F = 0.65	14
Percentage Female	OH(M)(8)	No Support	F = 8.20	14
Model: (M) Average Male Wages				
Test of Internal Labor				
ILM Influence	OH(M)(9)	Partial Support	F = 11.90	15
			F = 1.11	
Equal Variance	OH(M)(10)	Support	F = 4.45	16
			F = 6.62	16
			F = 1.49	16

Table 29
(con't)
Summary of Findings

ITEM	OH	FINDING	RELATION	TABLE
Model: (F) Average Female Wages				
Dependent Variable: Avg. Female Salary Full Professor Rank				
Independent Variables:				
Ability to Pay	OH(F)(1)	Support	F = 95.35	17
Willingness to Pay	OH(F)(2)	Support	F = 4.44	17
Size	OH(F)(3)	Support	F = 17.35	17
Unionization	OH(F)(4)	No Support	F = 0.93	17
Growth	OH(F)(5)	No Support	F = 1.06	17
Geographic Location	OH(F)(6)	No Support		17
Academic Mix	OH(F)(7)	No Support	F = 3.05	17
Percentage Female	OH(F)(8)	No Support	F = 4.83	17
Model: (F) Average Female Wages				
Dependent Variable: Avg. Female Salary Associate Professor Rank				
Independent Variables:				
Ability to Pay	OH(F)(1)	Support	F = 73.44	18
Willingness to Pay	OH(F)(2)	Support	F = 5.73	18
Size	OH(F)(3)	Support	F = 10.25	18
Unionization	OH(F)(4)	No Support	F = 0.00	18
Growth	OH(F)(5)	No Support	F = 0.17	18
Geographic Location	OH(F)(6)	No Support		18
Academic Mix	OH(F)(7)	No Support	F = 2.93	18
Percentage Female	OH(F)(8)	No Support	F = 7.55	18
Model: (F) Average Female Wages				
Dependent Variable: Avg. Female Salary Assistant Professor Rank				
Independent Variables:				
Ability to Pay	OH(F)(1)	Support	F = 81.57	19
Willingness to Pay	OH(F)(2)	Support	F = 1.06	19
Size	OH(F)(3)	Support	F = 14.01	19
Unionization	OH(F)(4)	No Support	F = 0.15	19
Growth	OH(F)(5)	No Support	F = 0.32	19
Geographic Location	OH(F)(6)	No Support		19
Academic Mix	OH(F)(7)	No Support	F = 2.55	19
Percentage Female	OH(F)(8)	No Support	F = 4.27	19

Table 29
(con't)
Summary of Findings

ITEM	OH	FINDING	RELATION	TABLE
Model: (F) Average Female Wages				
Test of Internal Labor Market				
ILM Influence	OH(F)(9)	Partial Support	F = 4.44	20
			F = 1.11	
Equal Variance	OH(F)(10)	Support	F = 2.43	21
			F = 6.09	
			F = 1.82	
Variance Explained	OH(C)(1)	No Support	F = 2.43	22
	OH(C)(2)		F = 4.67	
			F = 5.50	
Model: (D) Gender-Related Wage Differentials				
Segregation of Women	OH(D)(1)	No Support	t = -0.56	23
			t = -1.98	23
			t = -1.78	23
Male/Female Within Organization Wages High Ability to Pay	OH(D)(2a)	No Support	d = 4146.10	24
			d = 1945.60	25
			d = 2371.80	26
Male/Female Within Organization Wages Low Ability to Pay	OH(D)(2b)	No Support	d = 2993.80	24
			d = 1907.20	25
			d = 2270.30	26
Male/Male Across Organization Wages Entry Level	OH(D)(3a)	No Support	d = 2234.10	27
Female/Female Across Organization Wages Entry Level	OH(D)(3b)	No Support	d = 2132.60	27
Male/Male Across Organization Wages Associate Rank	OH(D)(4a)	Support	d = 2618.40	28
Male/Male Across Organization Wages Full Rank	OH(D)(4a)	Support	d = 5798.90	28
Female/Female Across Organization Wages Associate Rank	OH(D)(4b)	Support	d = 2580.00	28
Female/Female Across Organization Wages Full Rank	OH(D)(4b)	Support	d = 4646.50	28

effect on wages at all ranks in the overall wage equations and male wage equations. Willingness to pay had a positive significant effect on women's wages at the full and associate levels.

The organizational characteristic variable, size, had a positive significant effect on average wages in all equations. Hypotheses had predicted a significant positive relationship between unionization and wages, however, unionization had a significant negative effect on overall wages and men's wages at the full level, and on men's wages at the assistant level. Geographic location variables indicated significant regional differences between average wages at the full and associate professor levels, but not at the assistant level where geographic location did not have a significant influence on wages.

Organizational growth was not a significant explanatory factor in any wage equations. The number of professional programs used to represent academic mix influences on wages also had no significant effect on wages in any equations.

Tests of the internal labor market showed general support in all models. A comparison of R^2 values across equations by rank showed that there was a significantly larger effect of ability to pay on wages at the full rank, but that the R^2 value was not significantly larger at the associate than assistant as had been expected. In all

cases however, regression coefficients for ability to pay and willingness to pay variables increased by rank, indicating a greater influence of ability to pay and willingness to pay on wages at upper job levels. The hypotheses of increasing variance in wages by rank were also supported for all wage equations.

In examining hypotheses concerning the relationship between the percentage of women and wages, percentage female had a significant negative effect on wages at all levels for both men and women. The effect of percentage female on wages was greatly reduced in all wage equations however, after accounting for other factors that influence wages, as indicated by the decrease in the size of the regression coefficients from the simple regressions of wages and percentage female to the multiple regressions.

In summarizing results of the gender-related wage differential model, the hypothesis that women were segregated into low ability to pay schools was not supported at any rank. There was no significant difference in the growth rate of the percentage of women at high and low ability to pay schools. Tests of within organization average wages of men and women showed that there was a significant difference between the wages of men and women within low ability to pay schools and within high ability to pay schools at all ranks. Tests also showed that there was a significant difference in wages of men and women

across high and low ability to pay schools at all ranks. This was predicted for the full and associate ranks, but not the assistant rank.

The results and implications of the results will be further discussed and analyzed in Chapter 5, where suggestions for future research will also be presented.

CHAPTER V

DISCUSSION OF RESULTS

INTRODUCTION

The research findings presented in Chapter IV are discussed in Chapter V. Results of hypotheses testing the models of average wages, average wages of men, average wages of women, and the gender-related wage differential are further explored. Conclusions are drawn and implications of the findings are considered. Limitations of the study are also presented. Chapter V concludes with suggestions for future research.

CONCLUSIONS AND IMPLICATIONS

The purpose of this study was to examine the role of ability to pay, willingness to pay, and organizational characteristics in wage differentials and gender-related wage differentials across organizations. The models that were developed in the study sought to investigate the factors that influenced overall wages, the wages of men, wages of women, and the development of gender-related wage differentials at the organizational level. Based on the results of empirical tests of those models, several conclusions and implications regarding the proposed relationships are discussed below.

Ability to Pay

According to the Marginal Revenue Productivity Theory of wage determination, ability to pay is an important constraint on wages and plays an important role in the wage determination process and the development of wage differentials across organizations (Mahoney, 1979). It was within that theoretical framework that the relationship between ability to pay and wages was analyzed. Past empirical studies have provided mixed support for the relationship between wages and ability to pay (Landon and Baird, 1971; Schemenner, 1973; Ehrenberg and Goldstein, 1975; Weber, 1980; Easton, 1988). This study, however, found a significant positive relationship between ability to pay and wages when controlling for willingness to pay, organizational characteristics and the percentage of women in the organization. This relationship between ability to pay and wages was found in the model of overall wages, the wages of men, and the wages of women at each of the three ranks tested.

The finding that ability to pay has a significant positive effect on wages at all levels is important to compensation theory and practice. The significant relationship between ability to pay and wages in all models tested provides strong empirical support for the conceptual analysis that ability to pay is an important determinant of wages. The findings are also consistent with the results

of Hills and Hughes (1977), Matthews and Holmes (1982), and Ward and Fackender (1987) who also found a significant positive relationship between wages and ability to pay. The findings suggest that as ability to pay increases, so to do average wages for both men and women, and that high ability to pay organizations do in fact pay higher average wages than low ability to pay organizations.

Willingness to Pay

While also theoretically important to the wage determination process (Hills and Hughes, 1977), willingness to pay has been studied less often empirically, and has also received mixed empirical results (Landon and Baird, 1971). Support was found in this study for the importance of willingness to pay in wage determination. The results show that willingness to pay has a significant positive effect on wages. This finding is consistent with that of Hills and Hughes (1977). Willingness to pay was a significant determinant of wages at all ranks in the overall wage equations and in male wage equations. Willingness to pay also had a positive significant effect on women's wages at the full and associate levels. This study had included three measures of willingness to pay in an attempt to improve on past empirical measures of the construct. Of the measures of willingness to pay included however, the one that was found to be significant was per

capita tax rate. This was the same measure used by Hills and Hughes (1977). This suggests that per capita tax rate is capturing some intent of willingness to pay wages.

The findings of the study concerning willingness to pay therefore imply that organizations with a high willingness to pay will pay higher wages. The lack of a significant relationship between willingness to pay and the wages of women at the assistant rank could imply that men and women are treated differently at that level in the wage determination process. It could be that while organizations are able to pay women higher wages, they are not as willing to do so as they are men. It is also possible that women are willing to accept lower wages so organizations have more discretion in the decision of how to allocate funds they are able to spend for wages.

Organizational Characteristics

The conceptual literature on institutional wage determination argues that certain characteristics can have an important effect on wage differentials across organizations. This study included measures for four organizational characteristic variables that are theoretically important determinants of wages and that had received some past empirical support. The findings for tests of those variables, size, unionization, growth, and geographic region are discussed below, as are the results

of tests of another organizational characteristic variable, number of professional programs, included to control for intra-organizational job differences.

Size: While past studies had examined the effect of size on wage levels (Masters, 1969; Pugel, 1978; Bailey and Schwenk, 1980; Personick and Barsky, 1982; Kwoka, 1983), no studies were identified in the literature which investigated the relationship between organizational size and wage levels within one industry. Theory suggests that if size is important to wage determination across industries, it should also be important within industries. That belief was supported in this study. The organizational characteristic variable, size, had a positive significant effect on average wages in all equations. The effect was similar across equations of overall wages, the wages of men, and the wages of women at each of the levels tested. The findings suggest that larger organizations pay higher wages. The finding in the models of increasing size of the regression coefficients with rank also implies that the influence of size increases with job level at the organization. A greater effect of size at upper job levels would support the contention of internal labor market theory that organizational characteristics play a greater role in wage determination at upper levels than at the entry job level.

Unionization: As discussed in the review of the literature, one organizational characteristic variable that has been examined in several studies of wage determination is unionization. In keeping with the general findings of empirical studies of the role of unionization on wages (Masters, 1969; Kwoka, 1983; Hodson, 1983), hypotheses of this study had predicted a significant positive relationship would exist between the presence of a union and wages. That relationship was not supported by this study. Conversely, the results here suggest that unionization has a significant negative effect on wages in some instances. This negative effect was found for overall wages at the full level and for men's wages at the full and assistant level.

One possible explanation for these findings is that instead of organizing at universities with high wages, unions have more success in organizing at universities with poor wages to try and improve those wages. Another explanation for the finding is that unions may push for more objective measures of wage determination at the organization for all jobs, and in that way, have a leveling effect on wages across job levels. Without the union then, there may be a larger difference between wages at the assistant, associate and full ranks.

The lack of an effect of unionization on the wages of

women could suggest that universities follow union contract agreements when paying men but not women. This situation might occur if universities were attempting to hire more women to meet affirmative action guidelines and had to pay higher wages to attract those women. If that were the case, then it might be expected that unionized universities would have a larger percentage of women than non-unionized universities. An examination of the data reveals that there is a difference in the percentage of women at unionized and non-unionized universities. Unionized universities have a larger percentage of women at all ranks, and that differential is statistically significant ($p < .05$) at the associate and full ranks. This finding implies that the lack of a negative effect of unionization on women's wages is due to exceptions for women in union-negotiated pay policies.

Geographic Region: Another organizational characteristic variable that has been shown to explain wage differences across organizations is the geographic location of the organization (Antos and Rosen, 1974; Baldwin and Daski, 1976; Pheffer and Davis-Blake, 1987). The theoretical importance of geographic region to wage determination was also supported by this study. Geographic location variables indicated significant regional differences between average wages at the full and associate professor

levels in the overall wage equations and for the wages of men. No effect was found however, at the assistant level where geographic location did not have a significant influence on wages.

These findings suggest that region has more influence on wages at upper levels in the organization. Results also suggest that at the entry level, organizations are price takers and must pay wages set by the external labor market to attract workers regardless of the region (Hills and Hughes, 1977). The lack of an effect of geographic region for the wages of women raise issues regarding the geographic mobility of women. Some literature suggests that women are less mobile than men, and will therefore accept lower wages regardless of geographic region because they have fewer job choice alternatives (Filer, 1985).

Growth: Past literature had suggested that organizational growth would have a positive effect on wages since organizations that were growing would have an increased demand for workers and thus pay higher wages to attract those workers (Hodson, 1983). No studies were identified which tested this relationship within one industry as was done in this study. The results of this study show no support for the theoretical importance of growth to wage determination. Organizational growth was not a significant explanatory factor in any wage equations. The lack of a

relationship between growth and wages may indicate that the effects of growth might better be seen in a longitudinal study where changes can better be analyzed over time.

Academic Mix: As was discussed in the development of models of the study, this study was designed as an organizational level study of wage determination and gender-related wage differentials. As such, it was not within the scope of the study to include all of the factors that influence within-organization wage differences. However, one variable was included to control for the fact that traditionally, for reasons that are the topic of continuing investigations, women and men enter different kinds of jobs within the organization that may lead to gender-related wage differentials. In this study, the number of professional programs was used to represent academic mix influences on wages. It was believed that the more professional programs a university had, the higher the average wages would be since these are areas traditionally dominated by men. That hypothesis was not supported by the study, since the number of professional programs had no significant effect on wages in any of the equations tested. This finding suggests that a better method of capturing individual differences in job placement and wages is needed for future studies.

Internal Labor Market

As discussed in the review of the literature, the theoretical construct of internal labor markets proposes that organizations are price takers for workers at the entry level and must pay wages set by the external labor market (Doeringer, 1967). Organizations have more discretion in wage determination at upper job levels in the organization. The study hypothesized that if the forces of the internal labor market were operating in organizations, then ability to pay and organizational characteristics would have more impact on wages at upper job levels, and that since organizations were more insulated from external forces at upper job levels, wages at upper levels would show more variation across organizations.

Tests of the internal labor market showed general support for internal labor market theory in all wage equations tested. While R^2 values were not significantly higher at the associate than assistant level as would be expected if ability to pay had a greater effect on wages at the associate level, R^2 values were the largest at the full rank, which supports the theory that the models would be most explanatory of wages at the upper job levels (Hills, 1987). The hypotheses of increasing variance in wages by rank were supported for all wage equations. The variance in average wages by rank increased from the assistant to associate to full ranks. Since there is significantly

greater variation in wages at upper levels, this implies that salary levels are a function of internal organization decision making at the upper levels.

The increasing influence of the internal labor market at upper job levels was also demonstrated by the increase in regression coefficients for ability to pay and willingness to pay variables by rank, indicating a greater influence of ability to pay and willingness to pay on wages at upper job levels. The size variable also had a greater influence on wages by rank, as would be expected with the internal labor market. The results of tests of the geographic location variables also show support for internal labor market theory. If organizations are price takers for wages at the entry level, then wages should be similar across organizations regardless of the region. This relationship was supported since there was no effect of geographic location on wages at the entry level, but there was an increasing effect from the associate to full levels. The results of this study are consistent with those of Hills and Hughes, (1977) who also found an increasing effect of ability to pay and geographic location with rank and no effect of geographic region at the entry level. These findings further support the hypothesis that organizations are price takers in the external market for labor at the port of entry, but at upper levels have more discretion in wage determination.

Percentage of Women and Gender-Related Wage Differentials

A central purpose of this study was an attempt to explain gender-related wages differences in terms of the characteristics of organizations in which women are employed. The conceptual literature and past research has suggested that women are segregated into lower-paying organizations (Blau, 1977; Hodson, 1986). Some studies have also suggested that the lower wages of those organizations might be due to structural factors which make the organizations less able to pay high wages (Blau, 1977; Hodson and England, 1986; Pheffer and Davis-Blake, 1987). Gender-related wage differentials would therefore be due to the fact that women are segregated into organizations with disadvantageous characteristics, and it is these characteristics of the organization that lead to wage differentials instead of discrimination by the organization.

The models and hypotheses developed by this study were designed within that theoretical framework to test the belief that gender-related wage differentials arise due to organizational influences on wage levels. It was believed that once the effects of ability to pay, willingness to pay, and organizational characteristics were accounted for, the percentage of women would no longer have a significant negative impact on wages. It was further proposed that if

gender-related wage differentials were due to differing financial capability of organizations, then there would be no difference between men's and women's wages within an organization, but that there would be differences across high and low ability to pay organizations.

The results of the hypotheses concerning the relationship between the percentage of women and wages indicate that even after accounting for ability and willingness to pay and organizational characteristics, percentage female had a significant negative on wages at all levels for both men and women. This finding is consistent with the findings of previous research (Blau, 1977; Pheffer and Davis-Blake, 1987) and implies that women have lower average salaries than men, but also that women lower the overall average salary at the organization. The results suggest that as long as women earn less than men, which they do at all levels in this study, then they will have a significant negative effect on the wages of men as well as their own wages.

In examining whether the gender-related wage differential was due to the segregation of women into lower ability to pay organizations, it was first hypothesized that if segregation were occurring over time, then there would be a smaller increase in the percentage of women at high ability to pay organizations over the past ten years. This was not found to be the case. There was no

significant difference in the growth rate of the percentage of women across high and low ability to pay universities. High ability to pay universities showed a slightly larger increase in percentage women than low ability to pay universities, which was the opposite of what had been expected. These results imply that there is no significant difference in the placement of women across organizations and that women are not segregated into low ability to pay organizations.

The results also imply that ability to pay does not explain gender-related wage differentials across organizations. It had been hypothesized that if gender-related wage differentials were due to structural factors and ability to pay, then there would be wage differences across high and low ability to pay universities, but, that there would not be differences between men's and women's wages within an organization. If the organization had a low ability to pay, for instance, then both men and women would receive low wages. Tests of across organization average wages showed that there was a significant difference in wages of men and women across high and low ability to pay universities at all ranks, so that wages of men and women were higher in higher ability to pay universities and vice versa. Tests of within organization wages also showed however, that there was a significant difference between the wages of men and women within low

ability to pay universities and within high ability to pay universities at all ranks. There was also a larger differential between men's and women's average wages at high ability to pay universities than low.

These findings suggest several alternative hypotheses which cannot be accepted or refuted by this study, but which could be investigated in future efforts concerning gender-related wage differentials. One possible explanation for the significant negative effect of the percentage of women on wages and the significant differential between men's and women's wages is that there is discrimination in the determination of women's wages. This conclusion would support the contention by some that sex discrimination is frequent in academics (Bergmann, 1986). A larger differential between men and women in high ability to pay universities could imply that high ability to pay organizations favor men in their pay practices and use their discretionary funds to increase the wages of men over women. Low ability to pay organizations on the other hand, have less of a differential because they have less discretionary spending in salaries.

There are competing hypotheses however, that could be just as likely to exist. It could be that women's lower wages both within and across organizations are due to individual level, human capital variables that were not successfully captured in this study. The study attempted

to control for individual effects on wages, such as education and experience, by choosing only doctoral-granting universities which have similar entry requirements and by examining wages separately by rank.

There is the possibility though, that a seniority effect may be operating in the determination of wages which could explain the differential between men's and women's wages. Since women's entry into the academic labor market is still a relatively recent occurrence (Bergmann, 1986), it could be that gender-related wage differentials are due to the fact that men have greater seniority within all ranks and are compensated for that seniority through higher wages. Some evidence for this hypothesis can be seen by the large growth rate in the percentage of women at all ranks over the past ten years, and by the fact that the total number of male faculty is the greatest at the full rank and decreases with associate and assistant, while the number of women is the greatest at the assistant rank. There are still relatively few women at the associate and full ranks, which may indicate that men do have greater seniority at all ranks.

It may also be possible that women's lower average wages are due to their concentration into low-paying departments. The study attempted to capture that influence by controlling for the professional programs where women were systematically underrepresented. It could be that

even with the controls used, some organizational differences remained unmeasured.

LIMITATIONS

As is true of any research effort, this study has certain limitations. The discussion of these limitations is not meant to cast doubt on the findings, but rather, provides a context in which to interpret the study findings. It also serves as a way to discuss modifications to the study that could be made through future research and testing of the models developed here.

External Validity: The sample chosen for this study included doctoral granting, public universities across the United States. Although the chosen sample was limited to a particular type of public sector organization, the limitations served as controls to rule out alternative explanations of the findings. With support from the literature (Freund, 1974; Borjas, 1983), arguments concerning the application of wage theory to the public and private sector were made for the generalizability of study results to other public sector organizations and private sector organizations as well. However, the external validity of the study results to other organizations is unknown. External validity is an empirical question which

can only be resolved through future research.

Measurement Procedures: As discussed earlier, the variable in this study designed to capture within-occupation differences in academic mix and its effect on wages, the number of professional programs, did not show a significant positive relationship to wages as predicted. If the failure of that variable to have the hypothesized effect on wages is due to the technique used to measure it, then that is a limitation of the study which should be corrected through a more thorough conceptualization and measurement of academic mix in future research.

It may be necessary in future studies of gender-related wage differentials, to examine wages at both the individual and the organizational level. This could be accomplished in an across university study of wages and wage differences by academic department. Individual level studies of wages by department have been conducted within one university, but no studies were identified which examined departmental level wages across universities. This is most likely due to the great difficulty in obtaining the necessary data to conduct the study. If it were possible to collect the data however, a study of that type could provide a valuable contribution to the literature on gender-related wage differentials. Questions could then be investigated concerning whether women are

segregated into certain occupational catagories, whether those areas do pay less than the male-dominated areas, and whether this is the cause of gender-related wage differentials within and across organizations.

Scope of Variables: Not all variables identified in the literature as being related to wages or gender-related wage differentials were included. The study did not specifically include any individual-level variables that could affect wage differentials at the organization. It was believed that individuals would be fairly homogenous in terms of their stock of human capital so that individual level variables would not have a significant effect on an organizational-level wage study. As discussed earlier, the study did attempt to control for individual level characteristics that could affect wages through the nature of the sample chosen and the examination of wages by rank. It is possible that in spite of these controls, individual level characteristics still played a role in the development of wage differentials within the organization. If so, then future studies could measures to capture those effects.

SUGGESTIONS FOR FUTURE RESEARCH

The findings of this study have implications for those

conducting research in the areas of the determinants of organizational wages and gender-related wage differentials. The literature review indicates that empirical research on many aspects of wage determination and the gender-related wage differential is needed. Study findings suggest that future research in the areas discussed below would add to the understanding of factors that influence wage levels and the factors that contribute to a wage differential between men and women across organizations.

Ability and Willingness to Pay: The models tested in this study provide empirical support for the importance of ability and willingness to pay in the wage determination process and the development of wage differentials across organizations. As an investigation of ability to pay and university wage determination, the study serves as a replication and extension of the work of Hills and Hughes (1977). Further evidence for the validity of the models tested here would be achieved through a study of the role of ability and willingness to pay on wage determination utilizing data from a different sample of public sector organizations, such as health care, or with a study in a different industry with measures appropriate to that industry. This would provide a valuable contribution to the literature on the wage determination process.

Organizational Characteristics: Study results suggest that certain organizational characteristics play an important role in the wage determination process. Some variables however, did not have the hypothesized relationship to wages. Future research might incorporate alternative measures of the organizational characteristic variables that did not receive empirical support in this study in order to determine whether measurement difficulties interfered with the relationships being tested. One such alternative might include a different measure of organizational growth since this was not significant in any wage equation.

Another alternative would be to test the models separately by geographic region instead of relying on indicator variables as was done here. This alternative might be appropriate where sample size is large enough by region to permit it. Testing the wage equations by geographic region would allow for comparison of the factors that influence wages across those regions, to further investigate the effects of geography and the external labor market on wage levels across organizations.

Percentage of Women: There has been a tremendous increase in the participation of women in the labor force over the past ten years. Over sixty percent of women aged 25-64 are now part of the paid labor force in the United States

(MacLaury, 1987). This change was illustrated in the present study by the large increase in the percentage of women faculty from 1975 to 1985. At the full rank, the percentage of women increased from 2.2% to 8.8%. At the associate rank, the percentage increased from 4.3% to 21.1%, and at the assistant rank, the percentage of women increased from 9.3% to 35.3%. Another way to examine the impact the increase in the participation of women has had on overall organizational wage levels and on the wages of both men and women would be through a longitudinal study of the determinants of wages and gender-related wage differentials over the past five or ten years.

A longitudinal study would allow for the examination of any trends that might have developed over time (Intriligator, 1978). It would also help establish the causal relationship between the percentage of women and wages. A longitudinal study would also help control for other possible explanations of the results such as omitted organizational characteristic variables, that may occur in the cross-sectional analysis (Pindyck and Rubinfeld, 1981).

Another issue concerning the effect of women on wages raised through this study should be addressed in future research. The study proposed that one explanation for the gender-related wage differential was that women were segregated into lower ability to pay organizations. As was

discussed above, this hypothesis was not supported. Instead, it was found that there was no difference in the placement of women across organizations, but that there was a larger differential between men's and women's wages in high ability to pay universities than in low. Neither could the competing hypotheses suggested for that finding be supported or refuted by the study. Future research endeavors could therefore attempt to determine why in fact there is a larger differential between men's and women's wages in high ability to pay organizations by specifically examining the issues of: 1) differences in departmental structures across high and low ability to pay universities; and, 2) preferences towards men in the allocation of discretionary wage funds by high ability to pay universities.

Generalizability: As discussed above, the applicability of the models developed in this study to other populations and occupations is unknown but could be tested with future efforts at the organizational level. The models could be tested with other public sector organizations and private sector organizations as well, to answer the question about transferability of the hypotheses tested here to the private sector.

SUMMARY

The purpose of this study was to examine gender-related wage differentials across organizations and the effect of ability to pay wages on wage determination and gender-related wage differentials. The research questions proposed by the study addressed the issues of: 1) factors influencing organizational wage determination and the development of across-organizational wage differentials; 2) the factors influencing both men's and women's wages across organizations; and, 3) the role of ability to pay and organizational characteristics in the development of wage differentials between men and women. The significance of the findings show that ability to pay, willingness to pay, and organizational characteristics do have an important effect on organizational wage determination. They also show that even after controlling for ability to pay, willingness to pay, and organizational characteristics, the percentage of women in the organization still has a significant effect on wages.

LITERATURE CITED

Abowd, John M. and Mark R. Killingsworth (1983). "Sex discrimination, atrophy and the male-female wage differential" Industrial relations, 22, 387-402.

Aisenberg, Nadya and Mona Harrington (1988). "Two-tier faculty system reflects old social rules" Chronicle of higher education, A56.

American Council of Education American universities and colleges, 12th ed. New York: Walter de Gruyter, 1983.

Antos, Joseph R. and Sherwin Rosen (1974). "Discrimination in the market for public school teachers" Journal of econometrics, 3, 123-50.

Bailey, William R. and Albert E. Schwenk (1980). "Wage rate variation by size of establishment" Industrial relations, 19(2), 192-8.

Baldwin, Stephen E. and Robert S. Daski (1976). "Occupational pay differences among metropolitan areas" Monthly labor review, 99(5), 29-35.

Barnett, Vic and Toby Lewis Outliers in statistical data, 2nd ed. New York: John Wiley & Sons, 1984.

Barsky, Carl B. (1981). "Occupational wage variations in wood household furniture plants" Monthly labor review, 104(7), 37-9.

Beck, E. M., Patrick M. Horan and Charles M. Tolbert, II (1980). "Industrial Segmentation and Labor Market discrimination" Social problems, 28(2), 113-130.

Belcher, D.W. Compensation administration. Englewood Cliffs: Prentice-Hall, 1974.

Beller Andrea H. (1982). "Occupational segregation by sex: determinants and changes" Journal of human resources, 17(3), 372-91.

Bergmann, Barbara R. (1986). "Comparable worth for professors" Academe, 71(4), 8-10.

Bergmann, Barbara (1974). "Occupational segregation, wages and profits when employers discriminate by race or sex" Eastern economic journal, 1(2 and 3), 103-110.

Blau, Francine Equal pay in the office. Lexington: Heath, 1977.

Blau, Francine D. and Marianne A. Ferber The economics and women, men and work. Englewood Cliffs: Prentice-Hall, 1986.

Blinder, Alan (1973). "Wage discrimination: reduced form and structural estimates" Journal of human resources, 8(4), 436-55.

Bohlander, George W. (1980). "A statistical approach to assessing minority/white pay equity" Compensation review, 12(4), 15-24.

Borjas, George (1983). "The measurement of race and gender wage differentials: evidence from the public sector" Industrial and labor relations review, 37(1), 79-91.

Borjas, George (1980). "Wage determination in the Federal government: the role of constituents and bureaucrats" Journal of political economy, 88 (6), 1110-43.

Brenner, O. C. and Joseph Tomkiewicz (1979). "Job orientation of males and females: are sex differences declining?" Personnel psychology, 32, 741-50.

Brown, William, John Hayles, Barry Hughes and Lyndon Rowe (1985). "Product and labour markets in wage determination: some Australian evidence" British journal of industrial relations, 27(4), 169-76.

Buckley, John E. (1979). "Do area wages reflect area living costs?" Monthly labor review, 102(11), 24-32.

Butler, Richard J. (1982). "Estimating wage discrimination in the labor market" Journal of human resources, 17, 606-621.

Carlson, Barbara M. and Mary Pat McEnrue (1985). "Eliminating the gender based earnings gap: two alternatives" Business horizons, 28(4), 76-81.

Center for Education Statistics, State higher education profiles. Washington D.C.: U.S. Government Printing Office, 1988.

Chiplin, Brian (1979). "An evaluation of sex discrimination: some problems and a suggested reorientation" in Cynthia Lloyd, Emily Andrews, and Curtis Gilroy, eds. Women in the labor market. New York: Columbia University Press, 1979, 246-62.

Cohen, Jacob and Patricia Applied multiple regression and correlation analysis for the behavioral sciences. Hillsdale: Lawrence Erlbaum Associates, 1983.

Corcoran, Mary (1979). "Work experience, labor force withdrawls, and women's wages" in Cynthia Lloyd, Emily Andrews, and Curtis Gilroy, eds. Women in the labor market. New York: Columbia University Press, 1979, 215-45.

Corcoran, Mary, Greg J. Duncan and Michael Ponza (1983). "A longitudinal analysis of white women's wages" Journal of human resources, 18, 497-520.

Cox, Donald (1984). "Panel estimates of the effects of career interruptions on the earnings of women" Economic inquiry, 22(3), 386-403.

Creal, Richard C., Jan P. Miller, and John M. Toller 1987-88 Administrative compensation survey. Washington D.C.: College and University Personnel Association, 1988.

Doeringer, Peter B. (1967). "The structure of internal labor markets" in Thomas a. Mahoney ed. Compensation and reward perspectives. Homewood: Richard D. Irwin, Inc., 19-29.

Dunlop, John T. (1985). "Needed: an interdisciplinary approach to labor markets and wage determination" Monthly labor review, 108(7), 30-32.

Dunlop, John T. (1978) "The theory of wage determination" in Lloyd G. Reynolds et. al. eds., Readings in labor economics and labor relations 2nd ed. Englewood Cliffs: Prentice Hall, 1978.

Easton, Todd (1988). "Bargaining and the determinants of teacher salaries" Industrial and labor relations review, 41(2), 263-78.

Ehrenberg, Ronald G. and Gerald S. Goldstein (1975). "A model of public sector wage determination" Journal of urban economics, 2, 223-45.

Eberts, Randall W. and Joe A. Stone (1985). "Wages, fringe benefits and working conditions: an analysis of compensating differentials" Southern economics journal, 52(1), 274-80.

Emmert, Mark A. and Gregory B. Lewis (1985). "Pay equity and politics" Review of public personnel administration, 5(3), 50-64.

England, Paula (1981). "Assessing trends in occupational sex segregation, 1900-1976" in Ivar Berg, ed. Sociological perspectives on labor markets. New York: Academic Press, 1981, 273-95.

England, Paula (1986). "A dissenting view in favor of pay equity" Harvard journal of law and public policy, 9, 99-106.

England, Paula (1985). "Occupational segregation: rejoinder to Polochek" Journal of human resources, 20(3), 441-3.

England, Paula (1982). "The failure of human capital theory to explain occupational sex segregation" Journal of human resources, 17(3), 358-92.

England, Paula, Marilyn Chassie, and Linda McCormack (1982). "Skill demands and earnings in male and female occupations" Sociology and social research, 66(2), 147-68.

England, Paula and Steven McLaughlin (1979). "Sex segregation of jobs and male-female income differentials" in Rodolfo Alverez, Kenneth Lutterman and Associates, Discrimination in organizations, San Francisco: Jossey-Bass, 1979, 189-213.

Ferber, Marianne A. and Carole A. Green (1982). "Traditional or reverse sex discrimination? a case study of a large public university" Industrial and Labor Relations Review, 35(4), 550-64.

Ferber, Marianne A., Carole A. Green, and Joe L. Spaeth (1986). "Work power and earnings of women and men" AEA papers and proceedings, 76(2), 53-6.

Ferber, Marianne A. and Betty Kordick (1978). "Sex differentials in the earnings of Ph.D.s" Industrial and labor relations review, 31(2), 227-38.

Ferber, Marianne A. and Jane W. Loeb (1973). "Performance, rewards, and perceptions of sex discrimination among male and female faculty" American journal of sociology, 78(4), 995-1002.

Ferber, Marianne A., Jane W. Loeb, and Helen M Lowry (1978). "The economic status of women faculty: a reappraisal" Journal of human resources, 13(3) 385-401.

Filer, Randall K. (1985). "Male-female wage differentials: the importance of compensating differentials" Industrial and labor relations review, 38, 426-37.

Filer, Randall (1983). "Sexual differences in earnings: the role of individual personalities and tastes" Journal of human resources, 18, 82-99.

Filer, Randall K. (1986). "The effects of nonpecuniary compensation on estimates of labor supply functions" Quarterly review of economics and business, 26(1), 17-30.

Finn, Michael (1983). "The earnings gap and economic choices" in Phyllis Schlafly ed., Equal Pay for unequal work. Washington D. C.: Eagle Forum, 1983, 101-24.

Fiorite, Jack et. al. (1986). "Uniformity and variation in occupational earnings determinations: potential sources of incomparable worth" Journal of management, 12(1), 61-74.

Fogel, Walter and David Lewin (1974). "Wage determination in the public sector" Industrial and labor relations review, 27(3), 410-31.

Freund, James L. (1974). "Market and union influences on municipal employees wages" Industrial and labor relations review, 27(3), 391-404.

Ghiselli, Edwin E., John P. Campbell and Sheldon Zedeck Measurement theory for the behavioral sciences. San Francisco: W.H. Freeman and Company, 1981.

Gordon, Nancy M., Thomas E. Morton, and Ina C. Braden (1974). "Faculty salaries: is there discrimination by sex, race and discipline? American economic review, 64(3), 419-27.

Gottschalk, Peter T. (1978). "A comparison of marginal productivity and earnings by occupation" Industrial and labor relations review, 31(3), 368-78.

Granovetter, Mark (1981). "Toward a sociological theory of income differences" in Ivar Berg ed., Sociological perspectives on labor markets. New York: Academic Press, 1981, 12-43.

Haworth, Charles T. and Carol Jean Reuther (1978). "Industrial concentration and interindustry wage determination" Review of economics and statistics, 60(1), 85-95.

Hansen, W. Lee (1985). "Salary differences across disciplines" Academe, 71(4), 6-7.

Hills, Frederick S. Compensation decision making. Philadelphia: The Dryden Press, 1987.

Hills, Frederick S. and R. Eugene Hughes (1977). "Salaries and fringe benefits in an academic labor market: examining internal and external labor markets, explaining geographic differentials"

Hodson, Randy (1984). "Companies, industries, and measurement of economic segmentation" American sociological review, 49(3), 335-48.

Hodson, Randy (1978). "Labor in the monopoly, competitive and state sectors of production" Politics and society, 8(3 and 4), 429-80.

Hodson, Randy (1986). "Modeling the effects of industrial structure on wages and benefits" Work and occupations, 13, 488-510.

Hodson, Randy Workers' earnings and corporate economic structure. New York: Academic Press, 1983.

Hodson, Randy and Paula England (1986). "Industrial structure and sex differences in earnings" Industrial relations, 25(1), 16-32.

Intriligator, Michael D. Econometric models, techniques, and applications. Englewood Cliffs: Prentice-Hall, 1978.

Johnson, George E. and Frank P. Stafford (1974). "The earnings and promotion of women faculty" American economic review, 64(6), 888-903.

Jones, F. L. (1983). "On decomposing the wage gap: a critical comment on Blinder's method" Journal of human resources, 18(1), 126-30.

Jones, F. L. and Jonathan Kelly (1984). "Decomposing differences between groups: a cautionary note on measuring discrimination" Sociological methods and research, 12(3), 323-43.

Kahn, Lawrence M. (1980). "Wage growth and endogenous experience" Industrial relations, 19(1), 50-63.

Katz, David A. (1973). "Faculty salaries, promotions, and productivity at a large university" American economic review, 63(3), 469-77.

Koch, James V. and John F. Chizmer, Jr. (1976). "Sex discrimination and affirmative action in faculty salaries" Economic inquiry, 14, 16-24.

Kwoka, John E. (1983). "Monopoly, plant and union effects on worker wages" Industrial and labor relations review, 36(20, 251-8.

Landon, John H. (1970). "The effect of product market concentration on wage levels: an intra-industry approach" Industrial and labor relations review, 23(2), 237-47.

Landon, John H. and Robert N. Baird (1971). "Monopsony in the market for public school teachers" American economic review, 61, 966-71.

LaSorte, Michael A. (1971). "Academic women's salaries: equal pay for equal work?" Journal of higher education, 42(4), 265-78.

Lehrer, Evelen L. and Houston Stokes, (1985). "Determinants of the female occupational distribution: a log-linear probability analysis" Review of economics and statistics, 67(3), 395-404.

Lewis, Gregory B. (1985). "Sexual segregation of occupations and earnings differentials in Federal employment" Public administration quarterly, 9(3), 274-90.

Lloyd, Cynthia B. and Beth T. Niemi The economics of sex differentials. New York: Columbia University Press, 1979.

MacLaury, Bruce K. (1987). "Forward" in Clair Brown and Joseph Pechman eds., Gender in the workplace. Washington D.C.: The Brookings Institution, 1987, vii-viii.

Maddala, G.S. Econometrics. New York: McGraw-Hill, 1977.

Madden, Janice Fanning (1975). "Discrimination- a manisfestation of male market power?" in Cynthia Lloyd ed., Sex, discrimination and the division of labor. New York: Columbia University Press, 1975, 146-74.

Madden, Janice Fanning The economics of sex discrimination. Lexington: Lexington Books, 1973.

Mahoney, Thomas A. "Commentary" in Thomas A. Mahoney ed., Compensation and reward perspectives. Homewood: Richard D. Irwin, Inc., 1979.

Mallan, Lucy (1982). "Labor force participation, work experience and the pay gap between men and women" Journal of human resources, 17(3), 437-48.

Matthews, Kenneth M. and C. Thomas Holmes (1982). "District revenue potential and teacher salaries in florida: implications for teacher cost indices" Journal of education finance, 7, 348-53.

Masters, Stanley (1969). "An interindustry analysis of wages and plant size" Review of economics and statistics, 51(3), 341-45.

McDonough, Peter, Robert Snider and Joyce P. Kaufman (1979). "Male-female and white-minority pay differentials in a research organization" in Rodolfo Alverez, Kenneth Lutterman and Associates eds., Discrimination in organizations. San Francisco: Jossey-Bass, 1979, 123-57.

McLaughlin, Steven (1978). "Occupational sex identification and the assessment of male and female earnings inequality" American sociological review, 43(6), 909-21.

Mellor, Earl F. (1984). "Investigating the differences in weekly earnings of women and men" Monthly labor review, 107, 17-28.

Mellor, Earl F. and George D. Stamas (1982). "Usual weekly earnings: another look at intergroup differences and basic trends" Monthly labor review, 105(4), 15-24.

Mendenhall, William, James T. McClave and Madeline Ramey Statistics for psychology. ,North Scituate: Duxbury Press, 1977.

Meyer, Peter J and Maes, Patricia L. (1983). "The reproduction of occupational segregation among young women" Industrial relations, 22(1), 115-124.

Milkovich, George T. (1980). "The emergng debate" in E. Robert Livernash, ed. Comparable worth issues and answers. Washington D.C.: Equal Employment Advisory Council, 1980, 23-48.

Mincer Jacob and Haim Ofek (1982). "Interrupted work careers: depreciation and restoration of human capital" Journal of human resources, 17(1), 3-24.

Mincer, Jacob and Solomon Polachek (1974). "Family investments in human capital:earnings of women" Journal of policital economy, 82(2 Part II), S76-108.

Mincer, Jacob and Soloman Polachek (1978). "Women's earnings reexamined" Journal of human resources, 13(1), 119-35.

Neter, John, William Wasserman and Michael H. Kutner Applied linear regression models, 2nd ed. Boston: Irwin, 1989.

Norwood, Janet L. (1982). "The female-male earnings gap: a review of employment and earnings issues" BLS Report # 673, 1-10.

Nuso, Shirley and Lorraine Majka (1983). "The economic integraition of women" Work and occupations, 10(1), 29-48.

O'Neill, June (1985). "The trend in the male-female wage gap in the United States" Journal of labor economics, 3(1, pt.2), S91-116.

Personick, Martin E. and Carl B. Barsky (1982). "White collar pay levels linked to corporate work force size" Monthly labor review, 105(5), 23-8.

Pfeffer, Jeffrey and Alison Davis-Blake (1987). "The effect of the proportion of women on salaries: the case of college administrators" Administrative science quarterly, 32, 1-24.

Pindyck, Robert S. and Daniel L. Rubinfeld Econometric models and economic forecasts, 2nd ed. New York: McGraw-Hill, 1981.

Polachek, Solomon (1975). "Discontinuous labor force participation and its effect on women's earnings" in Cynthia Lloyd, ed. Sex, Discrimination and the Division of Labor. New York: Columbia University Press, 1975, 90-122.

Polachek, Solomon William (1985). "Occupation segregation: a defense of human capital predictions" Journal of human resources, 20, 437-40.

Polachek, Solomon William (1979). "Occupation segregation among women: theory, evidence and a prognosis" in Cynthia B. Lloyd, Emily S. Andrews, and Curtis L. Gilroy eds., Women in the labor market. New York: Columbia University Press, 1979, 137-57.

Pugel, Thomas A. (1980). "Profitability, concentration and interindustry variation in wages" Review of economics and statistics, 62(4), 248-53.

Raelin, Joseph A. (1982). "A comparative analysis of female-male early youth careers" Industrial relations, 21(2), 231-247.

Rao, M. J. and Ramesh C. Datta (1985). "Human Capital and Hierarchy" Economics Education Review, 4(1), 67-76.

Reagan, Barbara B. and Betty J. Maynard (1974). "Sex discrimination in universities: an approach through internal labor market analysis" AAUP Bulletin, 60(1), 13-21.

Reich, Michael, David M. Gordon and Richard C. Edwards (1980). "A theory of labor market segmentation" in Alice H. Amsden ed., The economics of women and work. New York: Penguin Books, 1980, 232-41.

Reskin, Barbara F. and Heidi I. Hartmann, eds. Women's work, men's work. Washington D. C.: National Academy Press, 1986.

Rexroat, Cynthia and Constance Shehan (1986). "Differential effects of industrial and worker resources on women's wages" Social science research, 15, 1-27.

Roos, Patricia A. (1981). "Sex stratification in the workplace: male-female differences in economic returns to occupation" Social science research, 10, 195-224.

Rosenbaum, James E. "Hierarchical and individual effects on earnings" Industrial relations, 19(1), 1-14.

Rosenfeld, Rachel A. (1979). "Women's occupational careers: individual and structural explanations" Sociology of work and occupations, 6(3), 283-311.

Rothschild, Kurt W. The theory of wages. New York: Augustus M. Kelley, 1976.

Rynes, Sara L., Donald P. Schwab, and Herbert G. Heneman III (1983). "The role of pay and parket pay variability in job application decisions" Organizational behavior and human performance, 31, 353-64.

Rytina, Nancy F. (1982). "Earnings of men and women: a look at specific occupations" Monthly labor review, 105(4), 25-31.

Rytina, Nancy F. (1982). "Tenure as a factor in the male-female earnings gap" Monthly labor review, 105(4), 32-34.

Sandell, Steven and David Shapiro (1978). "The theory of human capital and the earnings of women: a reexamination of the evidence", Journal of human resources, 13, 103-118.

Schmenner, Roger W. (1973). "The determination of municipal employee wages" Review of economics and statistics, 55(1), 83-90.

Seiling, Mark S. (1984). "Staffing patterns prominent in female-male earnings gap" Monthly labor review, 107, 29-33.

Shack-Marquez Janice (1984). "Earnings differences between men and women: an introductory note" Monthly labor review, 107, 15-16.

Shaw, Kathryn L. (1984). "A formulation of the earnings function using the concept of occupational investment" Journal of human resources, 19, 319-340.

Shaw, Lois (1985). "Determinants of the increased work attachment of married women" Work and occupations, 12(1), 41-57.

Snyder, David, Mark Haywood, and Paula Hudis (1978). "The location of change in the sexual structure of occupations, 1950-70: insight from labor market segmentation theory" American journal of sociology, 84(3), 706-717.

Spector, P.C. and J.H. Goodnight (1985). "Stepwise procedure" in SAS user's guide: statistics, 5th ed. Cary: SAS Institute, Inc.

Stratton Richard W. (1985). "Monopoly, monopsony and union strength and local labor market wage differentials: some evidence on their impacts" American journal of economics and society, 44(3), 305-18.

Stevenson, Mary (1975). "Relative wages and sex segregation by occupation" in Cynthia Lloyd, ed. Sex, Discrimination and the Division of Labor. New York: Columbia University Press, 1975, 175-200.

Stevenson, Mary Huff Determinants of low wages for women workers. New York: Praeger Publishers, 1984.

Stevenson, Mary Huff (1978). "Wage differences between men and women: economic theories" in Ann H. Stromberg and Shirley Harkess eds. Women working: theories and facts in perspective. Palo Alto: Mayfield Publishing Company, 1978, 89-107.

Treiman, Donald and Heidi Hartmann, eds. Women, work and wages: equal pay for jobs of equal value. Washington: National Academy Press, 1981.

Treiman, Donald and Kermitt Terrell (1975). "Women, work and wages- trends in the female occupational structure since 1940" in Kenneth Land and Seymour Spilerman, eds. Social Indicator Models. New York: Russell Sage, 1975, 157-91.

U.S. Department of Commerce, Government finances in 1985-86, Series GF-86, No. 5. Washington D.C.: Bureau of the Census, 1986.

U.S. Department of Commerce, State government tax collection in 1986, Washington D.C.: Bureau of the Census, 1986.

U.S. Department of Commerce, Statistical abstract of the United States 1986, 106th ed. Washington D.C.: Bureau of the Census, Office of Business Economic Regions, 1986.

U.S. Department of Education, (1986). "Fall enrollment in institutions of higher education survey" of the Higher education general information survey (HEGIS). XXI, 1986.

U.S. Department of Education, (1986). "Financial statistics of institutions of higher education survey" of the Higher education general information survey (HEGIS). XXI, 1986.

U.S. Department of Education, (1986). "Salaries, tenure, and fringe benefits of full-time institutional faculty survey" of the Higher education general information survey (HEGIS). XXI, 1986.

Ward, Kathryn B. and Charles W. Mueler (1985). "Sex differences in earnings: the influence of industrial sector, authority hierarchy and human capital variables" Work and occupations, 12(4), 437-63.

Ward, James G. and Thomas D. Fackender, (1987). "Determinants of teacher salary level: the Florida evidence: Journal of collective negotiations, 16(1), 63-70.

Ward, Kathryn B. and Fred C. Pampel, (1985). "More on the meaning of the effect of the sex ratio on the female labor force participation" Social science quarterly, 66(3), 675-9.

Ward, Kathryn B. and Fred C. Pampel, (1985). "Structural determinants of female labor force participation in developed nations 1955-75" Social science quarterly, 66(3), 654-67.

Webber, Charles T. (1980). "The ability to pay criterion: some recent evidence" Journal of collective negotiations, 9(3), 213-21.

Wonnacott, Ronald J. and Thomas H. Wonnacott Econometrics, 2nd ed. New York: John Wiley & Sons, 1979.

Zellner, Harriet (1975). "The determinants of occupational segregation" in Cynthia Lloyd ed., Sex, discrimination and the division of labor. New York: Columbia University Press, 1975, 125-45.

APPENDIX

List of Universities

Auburn University
University of Alabama
University of Alabama at Birmingham
University of Alabama at Huntsville
University of South Alabama
Arizona State University
Northern Arizona University
University of Arizona
University of Arkansas
California State University - Los Angeles
San Diego State University
San Francisco State University
University of California - Berkeley
University of California - Davis
University of California - Irvine
University of California - Los Angeles
University of California - Riverside
University of California - San Diego
University of California - Santa Barbara
University of California - Santa Cruz
Colorado State University
University of Colorado at Boulder
University of Delaware
Florida Agricultural and Mechanical University
Florida Atlantic University
Florida State University
University of Florida
University of South Florida
Georgia State University
University of Georgia
University of Hawaii at Manoa
Idaho State University
University of Idaho
Illinois State University
Northern Illinois University
Southern Illinois University Carbondale
Southern Illinois University Edwardsville
University of Illinois Urbana Campus
University of Illinois at Chicago
Ball State University
Indiana University
Indiana-Purdue University Indianapolis
Purdue University
Iowa State University
University of Northern Iowa
University of Iowa

APPENDIX (con't)

Kansas State University
University of Kansas
Wichita State University
University of Kentucky
University of Louisville
Louisiana Tech University
Louisiana State University
University of New Orleans
Northeast Louisiana University
Northwestern State University
University of Southwestern Louisiana
University of Maine at Orono
Morgan State University
University of Maryland College Park
University of Maryland Baltimore County
University of Lowell
University of Massachusetts at Amherst
Central Michigan University
Michigan State University
Oakland State University
Wayne State University
Western Michigan University
Jackson State University
Mississippi State University
University of Mississippi Main Campus
University of Southern Mississippi
University of Missouri - Columbia
University of Missouri - Kansas City
University of Missouri - Saint Louis
Montana State University
University of Montana
University of Nebraska - Lincoln
University of Nevada - Reno
University of Nevada - Las Vegas
University of New Hampshire
New Mexico State University
SUNY at Albany
SUNY at Binghamton
SUNY at Buffalo
SUNY at Stony Brook
East Carolina University
North Carolina State University
University of North Carolina at Chapel Hill
University of North Carolina at Greensboro
University of North Dakota
Bowling Green State University
Cleveland State University
Kent State University

APPENDIX (con't)

Ohio University
University of Akron
University of Cincinnati
University of Toledo
Oklahoma State University
University of Oklahoma
Oregon State University
Portland State University
University of Oregon
Temple University
University of Pittsburgh
University of Rhode Island
Clemson University
University of South Carolina at Columbia
South Dakota State University
East Tennessee State University
Memphis State University
Middle Tennessee State University
Tennessee State University
Tennessee Technological University
University of Tennessee - Knoxville
Lamar University
North Texas State University
Sam Houston State University
Stephen F. Austin State University
Texas A&I University
Texas Southern University
Texas Tech University
University of Houston - University Park
University of Texas at Arlington
University of Texas at Austin
University of Texas at El Paso
University of Utah
Utah State University
University of Vermont
College of William & Mary
Old Dominion University
Virginia Commonwealth University
George Mason University
Virginia Polytechnic Institute and State University
University of Washington
Washington State University
West Virginia University
University of Wisconson - Madison
University of Wisconson - Milwaukee
University of Wyoming
University of Central Florida
University of Minnesota Minneapolis Saint Paul

APPENDIX (con't)

University of Colorado at Denver
Ohio State University
Rutgers University
Pennsylvania State University
University of Virginia
Miami University Oxford Campus
Indiana University of Pennsylvania
University of Michigan - Ann Arbor
North Dakota State University
Indiana State University
University of Texas at Dallas
University of South Dakota
University of New Mexico
Texas A&M University
University of Connecticut

The two page vita has been removed from the scanned document. Page 1 of 2

The two page vita has been removed from the scanned document. Page 2 of 2