

THE GENDER WAGE GAP: EXPLORING THE EXPLANATIONS

by

JAIME ANDERSEN

B.A., Hastings College, 2006

A REPORT

submitted in partial fulfillment of the requirements for the degree

MASTER OF ARTS

Department of Economics
College of Arts and Sciences

KANSAS STATE UNIVERSITY
Manhattan, Kansas

2008

Approved by:

Major Professor
James Ragan

Abstract

This paper examines some common explanations for the earnings gap between males and females. Over recent decades, the average pay of women has increased faster than the average pay of men; however, a substantial earnings gap remains. As of 2006, the U.S. Census estimated that for year-round full-time workers the earnings ratio of women to men was 77%; in other words, for every one dollar a man earns, a woman earns \$0.77. The wage gap likely consists of both non-discriminatory and discriminatory aspects, and concern remains over how much of the gender wage gap is caused by discrimination against women. However, the part of the wage gap due to discrimination cannot be measured directly, so it is typically interpreted as the portion of the gap that is “unexplained” by other factors. Numerous economists and sociologists have studied this issue, but their conclusions differ vastly. This paper discusses various economic explanations for the gender pay gap, both discriminatory and non-discriminatory. It also briefly summarizes some sociological responses to economic arguments, as well as some policy recommendations and their possible implications.

Table of Contents

List of Figures	iv
List of Tables	v
CHAPTER 1 - Introduction	1
Background Information on the Gender Pay Ratio	1
Difficulties With Measuring the Pay Gap.....	3
CHAPTER 2 - Economic Explanations.....	4
Non-Discriminatory Factors	4
Human Capital	4
Occupational Segregation (Due to Preference).....	9
Discriminatory Factors	12
Occupational Segregation (Due to Societal Norms or Entry Barriers).....	12
Family and Childrearing Responsibilities.....	13
Hiring Discrimination	16
CHAPTER 3 - Sociological Perspectives	18
Reaction to Human Capital Theory	18
Devaluation of Women's Work.....	19
Discussion.....	20
CHAPTER 4 - Policy Recommendations and Their Implications.....	21
Comparable Worth.....	21
Stricter Anti-Discrimination Laws.....	23
CHAPTER 5 - Conclusion.....	24
References.....	26

List of Figures

Figure 1.1: Median Annual Earnings Ratio (full-time year round workers)	2
Figure 1.2: Median Weekly Earnings Ratio (full-time year round workers).....	2
Figure 1.3: Median Hourly Earnings Ratio (full-time year round workers).....	3
Figure 2.1: Educational Attainment.....	5
Figure 2.2: Percent Female in Each Educational Category	6

List of Tables

Table 2.1: Percent Women by Educational Field	7
Table 2.2: Occupational Composition and Earnings	9
Table 2.3: Effect of Number of Children on Women's Hourly Earnings	14
Table 4.1: Sample Point System for Comparable Worth.....	22

CHAPTER 1 - Introduction

“If all the economists were laid end to end, they’d never reach a conclusion.”

-George Bernard Shaw

“Give a scientist a problem and he will probably provide a solution; historians and sociologists, by contrast, can offer only opinions. Ask a dozen chemists the composition of an organic compound such as methane, and within a short time all twelve will have come up with the same solution of CH₄. Ask, however, a dozen economists or sociologists to provide policies to reduce unemployment or the level of crime and twelve widely differing opinions are likely to be offered.”

-Derek Gjertsen (British scientist and author)

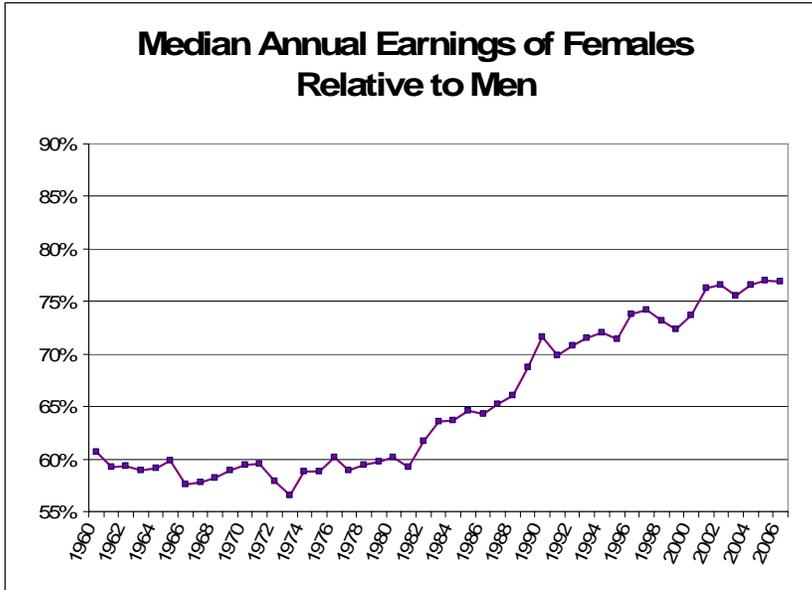
Economic issues often have complex and elusive explanations. Therefore, it is no surprise that multiple intelligent and knowledgeable people can reach vastly different conclusions. The issue of the gender wage gap is one such subject. Numerous economists have conducted studies on the earnings of women compared to men. Some of their findings are the same, but the most debated aspect involves the portion of the pay gap between men and women that seems to be “unexplained.” How much of the gap is due to discrimination? Are there reasonable market justifications? Can, or should, anything be done about it? Sociologists often examine this same issue, but from a different perspective. This paper will discuss various economic explanations for the gender pay gap, both discriminatory and non-discriminatory. It will also briefly summarize some sociological responses to economic arguments, as well as some policy recommendations and their possible implications.

Background Information on the Gender Pay Ratio

The gender pay ratio can be measured several ways, including hourly, weekly, and annual earnings. The U.S. Census Bureau collects data on the annual earnings of full-time year round workers. (Full-time is defined as working 35 or more hours per week.) According to the Census Bureau, the gender earnings ratio of women to men was roughly 60% from the late 1950’s to the early 1980’s. The gap then narrowed substantially, and by 2006 the ratio stood at about 77% (CPS Report 2006). The pay gap is smaller when weekly earnings are used. The Bureau of

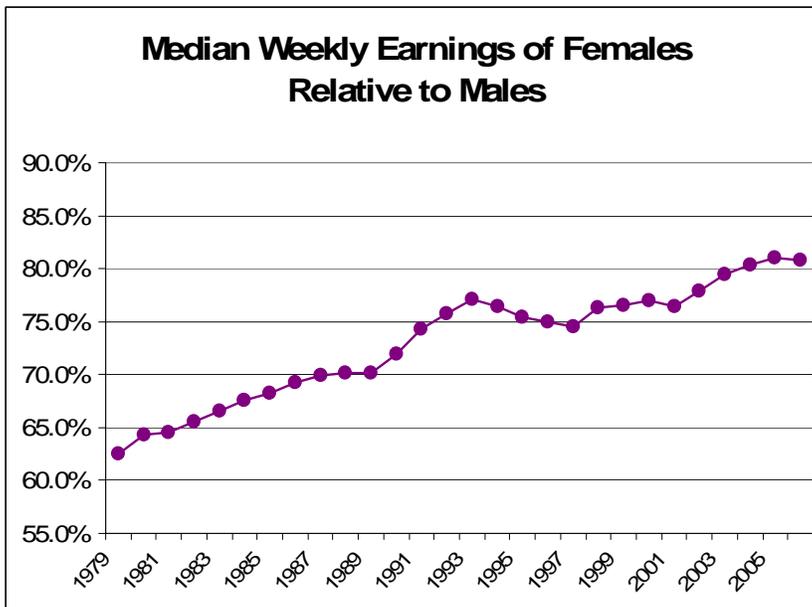
Labor Statistics collects data on the weekly earnings of full-time year round workers. The ratio still hovered around 60% through the 1970's, and then climbed to 70% by 1990 and 80% by 2006. (Highlight of Women's Earnings 2006)

Figure 1.1: Median Annual Earnings Ratio (full-time year round workers)



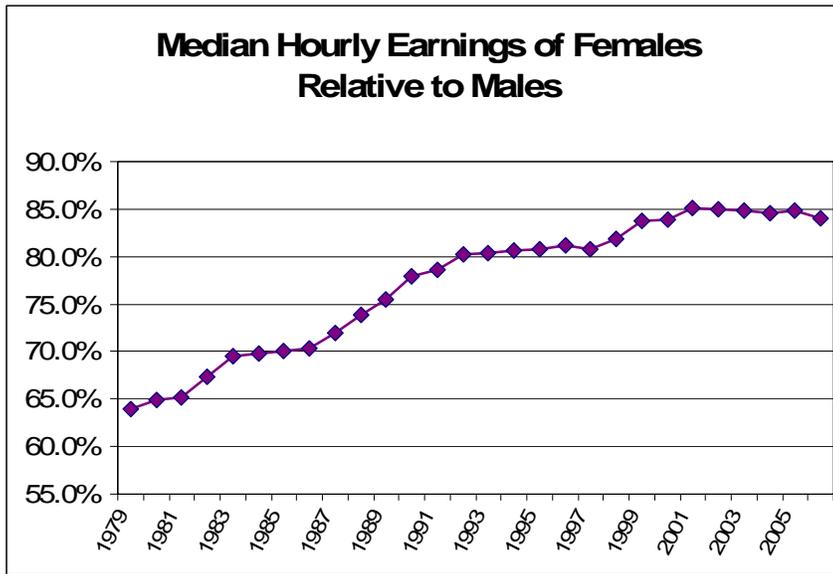
Source data: Current Population Survey, 2006.

Figure 1.2: Median Weekly Earnings Ratio (full-time year round workers)



Source data: Highlight of Women's Earnings, 2006.

Figure 1.3: Median Hourly Earnings Ratio (full-time year round workers)



Source data: Highlight of Women's Earnings, 2006.

As can be seen in the above figures, the pay ratio is highest (i.e., the wage gap is smallest) when hourly earnings are used. This is likely because, on average, males tend to work more hours per week than females. According to the American Time Use Survey from the Bureau of Labor Statistics, in 2006 full-time males worked an average of 8.44 hours a day, whereas full-time females worked an average of 7.65 hours a day (U.S. Bureau of Labor Statistics 2006). This amounts to an average of 42.2 average weekly hours for males and 38.25 weekly hours for females. This translates into difference of 3.95 hours a week. Therefore, the median weekly and annual earnings for females will naturally be a little lower than for males, causing a wider pay gap. If women and men are willingly choosing those hours, then the weekly and annual earnings ratio will overestimate the pay gap.

Although the gender pay ratio has improved in recent years, there still remains concern about whether discrimination plays a substantial role in the difference between female and male earnings.

Difficulties With Measuring the Pay Gap

Much of the reason there remains so much debate about the gender earnings gap is that multiple factors are interacting in complex ways. It is difficult to gather comprehensive data on the differences men and women bring into the labor market (such as experience, productivity,

personality, preferences, etc.) Also, it is impossible to measure “discrimination” directly. Economists can run wage regressions to determine how much of the wage can be explained by certain variables (such as number of hours worked, educational level, tenure, etc.) However there is no “variable” to measure discrimination. Therefore, after all other factors have been controlled for in the regression, the rest of the gap (the “unexplained” portion) is often attributed to discriminatory practices (such as direct employer discrimination or occupational barriers). The problem with regressions is that the appropriate relevant variables to include are difficult both to determine and gather data on. Therefore, even the most detailed studies cannot provide irrefutable proof of either discrimination or the reasons behind it. Subsequently, the explanations of the pay gap are debatable and indeterminate. This paper will explore several of these explanations.

CHAPTER 2 - Economic Explanations

Numerous economists have conducted studies that can account for much of the pay gap. The debate arises about whether these reasons have discriminatory components. The first part of this section will discuss the common non-discriminatory reasons for the earnings difference. The second part will discuss how gender discrimination may play a role.

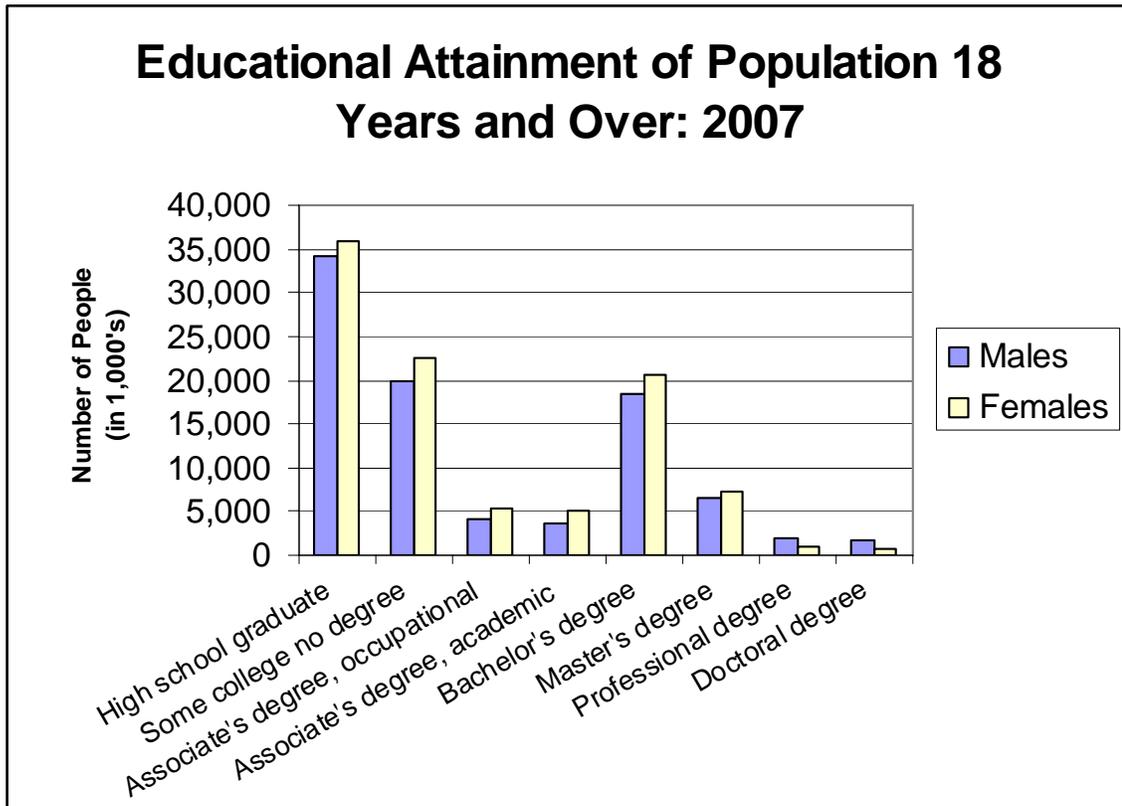
Non-Discriminatory Factors

Human Capital

One of the most researched explanations is the differences in human capital between men and women. Human capital is the “investment” workers make in themselves in order to improve their skills, productivity, and thus lifetime earnings. For example education, training, and years of experience are the most common forms of human capital. Men and women can differ in both the amount of human capital attained (years of education) and type of human capital attained (field of study). However, the *amount* of human capital attained (as measured by education) is very similar between men and women. According to the U.S. Census Bureau, data from the

2007 Current Population Survey indicates that women actually outnumber men in most educational categories, including masters' degrees.

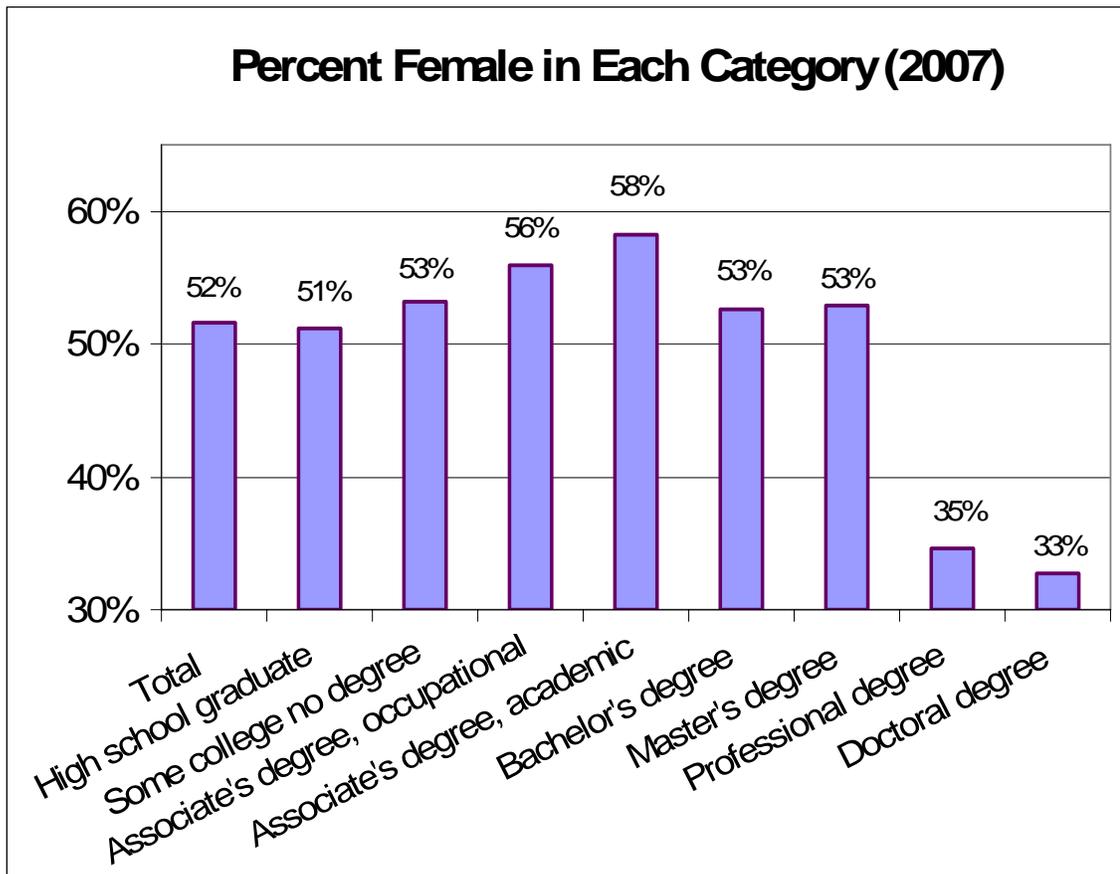
Figure 2.1: Educational Attainment



Source data: Current Population Survey, 2007.

However, the United States population also consists of more women than men: 107,843,000 men compared to 114,880,000 women, which means about 52% of the population are female (CPS 2007). When percentages are used, it is still clear that women comprise a larger portion of each category than men up to and including master's degree. However, women are disproportionately over-represented in associate's degree categories. Conversely, women are severely under-represented in the categories of professional and doctoral degrees. Only about 35% of professional degrees and 33% of doctoral degrees are awarded to women.

Figure 2.2: Percent Female in Each Educational Category



Source data: Current Population Survey, 2007.

It is important to note that while education levels appear similar in 2007, the educational attainment of men and women twenty to thirty years ago was different. Even though those differences have been mostly eliminated now, current earnings may still reflect some of the past educational advantages of men. Furthermore, it is notable that the two categories where men have attained more human capital than women (professional degree and doctoral degree) contain many of the relatively high-paying jobs.

Even though the *amount* of educational human capital is fairly similar now for men and women, the *type* of human capital attained is still very different. Women are disproportionately concentrated in college majors in the humanities, education, and social sciences departments, which lead to relatively low-paying occupations. Men are more likely to receive degrees in mathematics, sciences, or engineering fields, which lead to relatively high paying occupations.

Table 2.1: Percent Women by Educational Field

U.S. Population, Age 18 and Over with Bachelor's Degrees (2004)	
<i>Degree Field</i>	<i>Percent Women</i>
Agriculture	24%
Architecture	53%
Business	41%
Communications	54%
Computer	30%
Education	80%
Engineering	14%
Literature	70%
Foreign language	80%
Health sciences	83%
Liberal arts	58%
Mathematics	35%
Natural science	47%
Philosophy	48%
Pre-professional	62%
Psychology	72%
Social science	56%
Other	49%
Total	52%

Source data: U.S. Census Bureau, 2004 Panel of Program Participation.

Paglin and Rufolo (1990) argue that quantitative ability is a scarce attribute that impacts an occupation's pay. "Students who work in areas requiring a greater degree of mathematical ability will achieve a higher rate of return to their investment in human capital than students who generate a type of human capital that makes less use of mathematical ability" (Paglin and Rufolo 1990, p. 141). They find that males are disproportionately present in the high end of the distribution for mathematical aptitude (as measured by SAT mathematical and GRE quantitative scores), while females are disproportionately in the low end of the distribution. Therefore, the market can explain why females generally earn less than males.

Fields with a high proportion of women are not lower paying than other fields because of "crowding" brought on by discriminatory exclusion; they are lower paying because the human capital in these fields can be produced with less of an important scarce attribute

(quantitative ability)... Similarly, graduates in physical science and engineering are not paid more because of the high proportion of men in these fields but because the production of human capital in these areas requires a much higher than average level of mathematical ability. (Paglin and Rufolo 1990, p. 138)

In other words, males are more likely than females to obtain high math scores; therefore they are more likely to go into the fields of study requiring more quantitative ability. These fields of study tend to result in the higher paying jobs. The *reason* males are receiving higher math scores is unclear. It may not be that males are intrinsically better at math than females, but rather that more males tend to pursue mathematical education in high school (for a variety of sociological reasons).

Polachek (1981) has another explanation for why women choose to acquire different kinds of human capital: women rationally choose occupations that will maximize their lifetime earnings. If women expect their employment to be intermittent due to domestic responsibilities, they will choose a job with low penalties for intermittent employment. "If lifetime labor force participation differs across individuals, then occupational variations in the cost of labor force intermittency will cause an individual to choose that occupation that imposes the smallest penalty given his desired lifetime participation, *ceteris paribus*" (Polachek 1981, p. 64). In other words, women choose different fields of study because they will lead to occupations that optimize lifetime earnings. According to this theory, jobs with low penalties for intermittent employment will offer higher starting wages, but have a relatively flat wage trajectory, *ceteris paribus*. Jobs requiring significant lifetime commitment would tend to offer lower starting wages but steep wage trajectories (particularly those involving on-the-job training).

Mincer and Ofek (1982) also discuss the penalties for intermittent employment. They show that human capital depreciates (skills are lost) while that person is out of the workforce. They observe that wages are typically lower at the point of workforce reentry than they were before the labor force withdrawal. After the person reenters the workforce, wages tend to grow relatively rapidly. "This rapid growth appears to reflect the restoration (or 'repair') of previously eroded human capital" (Mincer and Ofek 1982, p.3). The loss of human capital due to workforce nonparticipation has a significantly negative impact on wages. Mincer and Ofek find that in the short run, spending one year out of the labor force causes between a 5.6% and 5.9% loss in wages (Mincer and Ofek 1982, p. 11). In the long run, one year out of the labor force causes a 1.5% and 1.8% loss in wages, even after the depreciated human capital has been restored

(Mincer and Ofek 1982, p. 11). Using this information, the following inference can be made: if women expect their employment to be intermittent, they will prefer to acquire a type of human capital with a relatively low rate of depreciation.

Moreover, the longer the interruption that is observed, the more likely it is that the returnees are people whose human capital is especially durable, whether it is a matter of personal resiliency (good memory) or environment (lesser changes in the field, or special opportunities that have arisen for them. (Mincer and Ofek 1982, p. 18)

Therefore, an occupation such as “high-school English teacher” may seem more appealing than “computer programmer.”

Occupational Segregation (Due to Preference)

As alluded to previously, women obtain different types of human capital and are thus segregated into different occupations. Occupational differences account for a major portion of the earnings difference between men and women, as the most common female occupations tend to be lower paying than male occupations. The table below shows some selected occupations with at least 1,000,000 workers. The percent female as well as the median weekly earnings (for both sexes) is displayed for three sections: occupations with the highest proportion female, the highest paying occupations, and the occupations with the lowest proportion female. The data was taken from the Bureau of Labor Statistics January 2008 publication, *Employment and Earnings* (Household Data Annual Averages, tables 11 and 39).

Table 2.2: Occupational Composition and Earnings

<i>Occupation</i>	<i>Percent Female</i>	<i>Median Weekly Earnings</i>
<i>Highest Percent Female</i>		
Dental Hygienists	99.2	\$946
Preschool and Kindergarten Teachers	97.3	\$567
Secretaries and Administrative Assistants	96.7	\$599
Child care workers	94.6	\$368
Licensed Practical and Vocational Nurses	93.2	\$668
Receptionists and Information Clerks	93.0	\$482
Hairdressers, Hairstylists, and Cosmetologists	92.9	\$425
Registered Nurses	91.7	\$984
Maids and Housekeeping Cleaners	89.2	\$366
Paralegals and Legal Assistants	88.4	\$797

Nursing, Psychiatric, and Home Health Aides	88.3	\$423
Dietitians and Nutritionists	87.6	\$734
Tellers	87.5	\$455
<i>Highest Paying</i>		
Chief Executive	25.6	\$1882
Pharmacist	53.3	\$1838
Lawyer	32.6	\$1591
Aerospace Engineers	10.5	\$1557
Computer Information Systems Manager	27.8	\$1553
Physician and Surgeon	30.0	\$1475
Computer Software Engineer	20.8	\$1455
Database Administrator	35.9	\$1345
Marketing and Sales Manager	38.8	\$1319
<i>Lowest Percent Female</i>		
Electrical and Electronics Engineers	8.6	\$1454
Construction Managers	8.1	\$1143
Engineering Managers	8.0	\$1713
Mechanical Engineers	7.3	\$1354
Janitors and Building Cleaners	5.9	\$434
Grounds Maintenance Workers	5.9	\$420
Fire Fighters	5.3	\$901
Truck Drivers	5.3	\$665
Aircraft Pilots and Flight Engineers	4.2	\$1358
Construction Laborers	2.7	\$514
Aircraft Mechanics and Service Technicians	2.1	\$889
Carpenters	1.9	\$615
Electricians	1.7	\$805
Roofers	0.9	\$550
Automotive Service Technicians and Mechanics	0.7	\$655
Highway Maintenance Workers	0.5	\$621

Source: Bureau of Labor Statistics, *Employment and Earnings* 2008.

There are two non-discriminatory explanations for the lower pay of predominately female occupations. The first is compensating wage differentials. Females may choose jobs with more comfortable and less hazardous work conditions, which will *ceteris paribus* lead to lower wages. “If women care more about non-pecuniary rewards (such as avoiding physical danger or having mother-friendly work conditions) than men, while men focus more on maximizing earnings, then women will trade off earnings for amenities by choosing safer, more mother-friendly jobs” (England 2005, p. 277). Some studies have found that women highly value geographic

proximity to family. Therefore, women may accept a lower paying job in their desired location, rather than relocate for a higher paying job. Another form of compensating wage differentials is flexibility and time off. Women may prefer the lower paying but more flexible jobs; they value the ease of placing work below family demands. Also, women are disproportionately present in the educational sector, which means they may value having summers off to spend with their children. A second explanation for the lower pay in “female” occupations is the supply-demand model. If the skills and human capital required for a job are relatively common (such as a general associate’s or bachelor’s degree), then the supply of qualified workers will be greater, resulting in a lower wage. However, if the type of human capital needed is very difficult to achieve (such as a mathematical engineering degree), then the low supply of qualified workers will result in a higher wage.

As for *why* females tend to be segregated into different occupations, several non-discriminatory explanations exist. As Polachek and Mincer (1974) argued, females are choosing the occupations that tend to be the most “mother-friendly” and offer the smallest penalty for intermittent employment. Females may choose occupations that will likely maximize lifetime earnings rather than occupations that simply have the highest wage.

Solberg (2004) offers a model relating past occupational preference to current occupation. He uses data from the 1991 National Longitudinal Survey of Youth, where respondents were asked what they would like to be doing at age 35 if they were to or had to work. He finds a correspondence between past occupational preference and current assignment. He also finds little evidence of hiring discrimination, and one of his models finds that discrimination could account for as little as 2.2% of the earnings gap between men and women.

In any case, the evidence clearly indicates that preference plays a role in the determination of occupational outcome which in turn plays a role in the determination of wages... Occupational preference and the acquisition of human capital may have been conditioned by past discrimination, but the effects of such conditioning have not been measured in this study. Nevertheless, there is weak evidence in this study that females are treated differently from males in attaining their desired occupation. (Solberg 2004, p. 24)

As Solberg mentions, past discrimination may have played a role in the types of jobs females aspire to, but there is little evidence to suggest current market discrimination is a major factor causing the gender earnings difference. (The role of past socialization and pre-market discrimination will be discussed in the next section.)

Discriminatory Factors

Occupational Segregation (Due to Societal Norms or Entry Barriers)

Other economists have argued that occupational segregation is determined primarily by societal norms (which influence “preferences”), socialization, and hiring discrimination. “We can conjecture that earmarking of paid jobs by sex has its origin in social systems that decree that women are and should be inferior in status to men, and in ideas about differences in aptitude and abilities between the sexes” (Bergmann 1989, p. 49). If women are taught at a young age about what types of jobs are socially acceptable for women, they will naturally gravitate towards those positions, which usually involve caretaking and nurturing aspects. This raises a complicated question: are women’s preferences really their own or have they been largely shaped by societal forces? If “preferences” were not developed freely, then pre-market discrimination plays a significant role in a woman’s choice of occupation.

Another explanation for occupational segregation is the barriers to entry that may lead to crowding in the female occupations. Barbara Bergmann has conducted extensive research in this area. If women are prevented from obtaining typical “male” jobs, they will be disproportionately forced into the typical female occupations. The high supply of workers in these occupations will result in a lower wage. Conversely, the lower supply of workers in the male occupations will result in a higher wage. Barriers to entry can be anything from discriminatory job requirements (being able to lift and carry 100 pounds) to psychological deterrents (harassment in the workplace).

Perhaps one of the best illustrations of barriers to entry is the case involving the New York City Fire Department in the late 1970’s. The occupation of firefighter (usually referred to as “fireman”) is typically associated with males. In 1977, the New York City Fire Department began looking for new recruits. However, they could no longer legally prevent women from applying. As women started applying to be a firefighter, the Fire Department came up with a new entrance exam, one that was more physically demanding than any test given in the past. All 90 women who took the new physical test (Exam 3040) failed. Brenda Berkman (one of the applicants) filed a class-action suit against the City and the Fire Department. The lawsuit examined a series of physical tests given in Exam 3040 and argued that those tests had little to do with a firefighter’s ability to perform the job. In 1982, Judge Charles Sifton ruled in favor of

Berkman, and the city was forced to revise the exam. When the “legal” barrier to entry was removed and women began joining the Fire Department, another type of barrier to entry arose: harassment.

Once in the firehouses, the women faced an array of hostile acts. Their safety equipment was constantly tampered with by male firefighters. On several occasions, the women rushed into burning buildings only to realize that someone had bled all the air out of their tanks. There were incidents of women being excluded from training and meals, and subjected to obscenity, verbal abuse, physical violence, death threats and even sexual molestations. (Public Broadcast System 1993)

Despite these conditions, some women firefighters persisted, and Brenda Berkman is now a captain with more than twenty years of experience. However, as the previous table indicated, as of 2007 women make up only 5.3% of all firefighters. It is likely that barriers to entry still exist in many of the “masculine” occupations.

Family and Childrearing Responsibilities

Family status has a different implication on earnings for females than it does for males. Married men with children tend to have higher earnings than unmarried men (CEA 1998). However, married women with children tend to have lower earnings than single women without children. The reason children are associated with lower wages for women but not for men is that women generally bear a majority of the childrearing responsibility. The American Time Use Survey of 2006 (conducted by the Bureau of Labor Statistics) found that married women who were employed full-time and lived in a household with young children spent an average of 1.5 hours per day on household activities (cooking, housework, etc.) and 1.9 hours per day caring for household children (ATUS Care of Household Children). Specific data for *married, full-time* employed men with young children was not available. However, employed men with a child under six spent an average of 1.16 hours per day on household activities (compared to 1.92 hours for employed women with a child under six), and 1.05 hours caring for household children (compared to 1.86 for women) (ATUS 2006, table 8). Women are more likely to either drop out of the labor force or reduce number of hours worked when they have young children. Employed women living in a household with a child under 6 worked an average of one hour less per day than employed women without children. However, employed men with a young child worked about the same amount as men in a household without young children (ATUS Work and Employment).

As mentioned previously, Mincer and Ofek (1982) found a significant wage penalty for intermittent employment. If a woman drops out of the labor force temporarily she not only becomes relatively less experienced, but her human capital depreciates, causing her wages upon reentry to be lower.

Budig and England (2001) found evidence of a significant wage penalty for motherhood. They argued that motherhood is not just correlated with lower wages, but it actually *causes* lower wages. They built upon a previous study by Waldfogel (1997) that found a 6% wage penalty for mothers with one child and a 13% wage penalty for mothers with two or more children (after controlling for marital status, experience, and education). Budig and England use a similar fixed-effects regression model with data from the 1982-1993 National Longitudinal Survey of Youth. They examine the effect of children on wages using a fixed-effects model that controls for “effects of unchanging aspects of cognitive aptitude, preferences resulting from early socialization, life cycle plans, tastes for affluence, future orientation, and other unmeasured human capital” (Budig and England 2001, p. 213). The analysis is conducted several times; once without any controls (except person-specific and year-specific fixed-effects), and then again while adding control variables for marital status, human capital variables, and job characteristics. The coefficients on the effect of number of children on women’s hourly wage are shown in the table below. (All were significant at the $p < .01$ level, as denoted by the “***”.)

Table 2.3: Effect of Number of Children on Women's Hourly Earnings

Control Variables in Model	Fixed-Effects Coefficient
Gross (no controls)	-.068**
Marital Status	-.073**
Marital Status and Human Capital Variables	-.047**
Marital Status, Human Capital Variables, and Job Characteristics	-.037**

Source: Budig and England 2001, p. 213

In general, the wage penalty for motherhood is around 7% per child. The penalty is reduced to 4.7% when controlling for human capital variables (education, full-time seniority, part-time seniority, full-time experience, part-time experience, number of breaks in employment, and whether currently enrolled in school). The addition of numerous job characteristics (QES and DOT measures, whether the current job is part-time, percent female of the occupation, and dummies for industry, whether the job is in government, unionized, in a child care occupation, or self-employment) further reduces the motherhood wage penalty to 3.7% per child. Budig and England suggest that this penalty arises from the effects of motherhood on productivity and/or from employer discrimination.

In an earlier study, Mincer and Polachek (1974) also analyzed the effect of marriage and children on women's earnings. They concluded that after marriage, women spend less than half of their lifetime participating in the labor market (on average). This reduction in labor force participation is made up of working fewer years in a lifetime, fewer weeks in a year, fewer hours in a week, and multiple entries and exits from the workforce (Mincer and Polachek 1974, p. 80). In Mincer and Polachek's analysis, the coefficient of home time is negative, which implies a net depreciation of earnings power. The home-time interval associated with marriage or the birth of the first child has different effects for women with different levels of schooling. For women with less than a high school education, the net depreciation is relatively small: -0.2% per year. For those with 12-15 years of schooling, the effect is larger: -1.3% per year. Finally, women with 16 or more years of schooling experience the largest net depreciation of earnings: -2.3% per year (Mincer and Polachek 1974, p. 91).

Mincer and Polachek allude to the possibility that family responsibilities are an underlying cause of the entire wage gap.

At this stage of research we cannot conclude that the remaining (unexplained) part of the wage gap is attributable to discrimination, nor, for that matter, that the "explained" part is not affected by discrimination... Of course, if division of labor in the family is equated with discrimination, all of the gap is by definition a symptom of discrimination. (Mincer and Polachek 1974, p. 103-104)

Miller (2006) finds that motherhood reduces both levels and slopes of age-wage profiles. She measures the cost of a work interruption as the sum of the foregone wages and the foregone human capital accumulation. She presents evidence that a woman's age at the birth of her first child has a significant effect on career earnings and post-motherhood wages. Miller concludes

that delaying motherhood leads to a substantial increase in career earnings by 10% per year and an increase in wage rates of 3% per year. In other words, early motherhood is not just correlated with low wages, but actually causes them (Miller 2006, p. 4).

According to England (2005), the fact that women still tend to bear most of the responsibility for childrearing directly affects “employment continuity, part-time job choice, and exclusivity of career focus,” all of which are important contributors to the sex gap in earnings (England 2005, p. 280).

Crittenden (2001) suggests that the comparison of men’s and women’s hourly earnings using full-time workers underestimates the gender wage gap, since only about half of the mothers of children under eighteen have full-time, year-round paying jobs (Crittenden 2001, p. 93).

To find the real difference between men’s and women’s earnings, one would have to compare the earnings of all male and female workers, both full- and part-time. And guess what one discovers? The average earnings of *all* female workers in 1999 were 59 percent of men’s earnings. Women who work for pay are still stuck at the age-old biblical value put on their labor. (Crittenden 2001, p. 93)

Crittenden also examines the forgone income associated with motherhood; she refers to it as a “mommy tax” and estimates it to be more than \$1 million for a college-educated American woman (Crittenden 2001, p. 5). Crittenden supports her estimate with similar findings. Burggraf calculated that “a husband and wife who earn a combined income of \$81,500 per year and who are equally capable will lose \$1.35 million if they have a child. Most of that lost income is the wages forgone by the primary parent” (Crittenden 2001, p. 89). Inflexible workplaces cause women to cut back on, or quit, their employment once they have children. Crittenden argues that this “mommy tax” is a significant contributor to the wage gap between men and women. She presents evidence from Sweden where family division of labor is more equal and parental leaves (for the mother and the father) are subsidized. “Swedish women on average have higher incomes, vis-à-vis men, than women anywhere else in the world” Crittenden 2001, p. 248).

Hiring Discrimination

Some studies have shown that women may be victims of hiring discrimination. Goldin and Rouse (1997) found that when orchestras began conducting “blind” auditions with a screen hiding the candidate’s identity, the probability that a woman would advance from certain

preliminary rounds increased by 50%. Previous hiring procedures consisted of a male director favoring his own (typically male) students. In 1970, female musicians comprised only 5% of the top five orchestras in the United States. The introduction of “blind” auditions greatly increased the proportion of female musicians because discrimination was common among the most renowned conductors. Typical stereotypes included, “women have smaller techniques than men,” “are more temperamental and more likely to demand special attention or treatment,” and “the more women [in an orchestra] the poorer the sound” (Goldin and Rouse 1997, p. 6). Goldin and Rouse estimate that the screened auditions can explain 25% to 46% of the increase in female orchestra members since 1970.

Neumark, Bank, and Van Nort (1996) also found evidence of sex discrimination in hiring. They conducted an audit study in which female and male applicants submitted essentially identical resumes for restaurant jobs. They found that women were 40% less likely than men to receive a job offer at high-price restaurants. Women were also 35% less likely to obtain an interview with those restaurants. However, hiring discrimination was not significant at low-price restaurants (which offer lower pay). Neumark, Bank, and Van Nort suggest that employer discrimination and customer discrimination are two of the possible sources of this difference in hiring. Bergmann (1986) argues that it is the friction between waitresses and other male employees that leads to the segregation of waiters in the high-priced restaurants and waitresses in the low-priced restaurants. “In American restaurants that offer fine food and/or a luxurious setting, the size of the check allows for tips big enough to attract male waiters. In cheaper restaurants, the owners put up with the friction rather than supplement the tips to an extent necessary to be able to have male waiters” (Bergmann quoted by Neumark, p. 916).

Blau and Kahn (2000) refer to several court cases indicating that some hiring discrimination still exists. For example, in a 1994 case against Lucky Stores, the judge found that “sex discrimination was the standard operating procedure at Lucky with respect to placement, promotion, movement to full-time positions, and the allocation of additional hours” (Judge Patel quoted by Blau and Kahn, p. 84). In 2000, the U.S. Information Agency paid a large settlement after women were denied high-paying positions in the communications field. In a 1990 case against Price Waterhouse, the judge ruled in favor of a female accountant who was rejected for a partnership position despite bringing in more business than the other 88 male candidates.

Blau and Kahn (2000) also refer to a 1999 study by McDowell, Singell, and Ziliak that found evidence of discrimination in academia. They studied faculty promotion in the economics profession and found that even after controlling for quality of Ph.D. training, publishing productivity, major field of specialization, current placement in a distinguished department, age, and post-Ph.D. experience, female economists were significantly less likely to be promoted from assistant to associate professor and from associate to full professor.

Ginther and Kahn (2004) further explore the treatment of women in academia. They conclude that women in economics are less likely to get tenure and take longer to achieve it. They estimate that about 30% of the “promotion gap” can be explained by the fact that women economists publish fewer papers than men, especially in nontop journals (Ginther and Kahn 2004, p. 211). However, much of the gender promotion gap remains unexplained by observable characteristics.

CHAPTER 3 - Sociological Perspectives

Reaction to Human Capital Theory

Many sociologists (and some economists) have criticized the traditional human capital theory and its role as a primary cause of the differences in earnings between men and women. In previous work, England, Reid, and Kilbourne (1996) found that the gender pay gap widens with age, and suggested that it may be because “female-dominated jobs offer less steep wage trajectories as experience or seniority accumulates” (England, Reid, and Kilbourne 1996, p. 511). Human capital theory reasons that those who plan non-continuous employment will choose a job with higher starting wages rather than a job that offers a steep wage trajectory (which may offer lower starting wages). However, England, Reid, and Kilbourne’s research does not support this theory; it directly challenges it. They find that more heavily female jobs actually pay lower starting wages. Using data from the 1979 National Longitudinal Survey of Youth, a fixed-effects regression model is used to predict starting wages from the proportion female in the job and from control variables. They conclude that “the sex composition of jobs directly affects their starting wages, net of the characteristics of the individuals in the jobs, net of detailed industry, net of

occupations' demands for skill and onerous working conditions, and net of whether the job is unionized" (England, Reid, and Kilbourne 1996, p. 520).

Devaluation of Women's Work

Sociologists have argued that women's work is often devalued, or viewed as less important than similar types of work done by males. Devaluation stems from cultural and institutional mechanisms. "Cultural ideas deprecate work done by women, and cultural beliefs lead to cognitive errors in which decision makers underestimate the contribution of female jobs to organizational goals, including the goal of increasing profits through increasing productivity" (England 2005, p. 278). Of course, the question arises as to why this unjustified devaluing still exists. One example of women's work that continues to be devalued is care work, such as child care, teaching, health care service, counseling, etc. England (2005) suggests three reasons for the low pay of care work. The first is the existence of positive externalities that make it difficult or impossible to obtain payment from all of the indirect beneficiaries.

Care providers contribute to the development of human capabilities that are of value not only to the client but to all those who interact with him or her. How could the teacher collect from the future employer or spouse of the student who later benefit from her labors? The work of caring is unusual in the extent to which benefits are spread beyond direct recipients of the service. This diffusion makes it easy for others to free ride, enjoying the benefits of care without paying its costs, making the work pay less than it would without this feature. (England 2005, p. 279)

The second reason is that the "customers" who most need the care work (children, the sick, the disabled, and the elderly) can't afford to pay much if anything. Therefore the caring labor will be badly paid unless a third party (such as a family member, the state, or a nonprofit) subsidizes it. Finally, care work may be low paying because the quality of care services is especially difficult to measure. Often the recipients of care work (children, elderly, etc.) may not be competent enough to judge its quality. Also, it is difficult for employers to monitor the many subtle emotional aspects of care (warmth, nurturance, reassurance, etc.).

Given the fact that the quality of care is hard to assess, one might ask why care workers are not among those who generally receive an efficiency wage. In such models, higher wage costs can be counterbalanced by higher effort, which in turn leads to higher output per worker. The idea is that paying above market-clearing wages may elicit effort more cost-effectively than surveillance. One reason this may not operate for care work is that the efficiency-wage strategy hinges on the assumption that average output per worker can

be measured, even if individual effort cannot. In the case of care services, however, outputs as well as inputs are difficult to measure. (England 2005, p. 280)

England, Reid, and Kilbourne (1996) find that the sex composition of jobs is a significant determinant of wages, even after controlling for other variables. As percent female in the occupation increases, wage decreases. Their model suggests that if someone moved from a job that was 0% female to one that was 100% female, that person's wage would decrease by 7% to 19%, all other things equal (England, Reid, and Kilbourne 1996, p 516). This provides support for the devaluation of women's work argument.

Crittenden (2001) also argues that care work, and motherhood in particular, is extremely undervalued. She advocates the addition of unpaid child care to a country's GDP.

Economists used to believe that national wealth came from three factors: land, labor, and capital. Now they recognize that human capital, or human knowledge, skills, and entrepreneurship, are more important than all others put together. What is still not acknowledged, by economists or the society, is that most human capital is created by mothers and other early teachers and caregivers. Mothers are the most valuable producers in the entire economy. Yet, what they do is not even considered work at all. (Interview on Crittenden's website)

Discussion

In general, the sociological perspective has a tendency to emphasize current market discrimination. However, the economic literature tends to be more analytical, and while discrimination is recognized as a component of the gender wage gap, there is more emphasis on explanatory causes and improvements over time. Just as sociologists have criticized economic explanations, economists also have reason to question the legitimacy of some sociological conclusions. Much of the disagreement stems over the inclusion and classification of relevant variables. For example, time spent out of the labor force may or may not be related to discrimination. As Solberg (1999) found, preferences play a significant role in occupational choices. Furthermore, if a married couple has a child and one of the parents needs to temporarily drop out of the labor force, it makes good economic sense for the parent with the lowest opportunity cost to be the one staying at home (i.e., the parent with the lower salary, which is usually the female). Additionally, it is hard to place a monetary value on preferences, desires, and utility. The focus on earnings differences is tied to the assumption that more money is better. However, not all people are concerned about maximizing income; some (particularly women) may be more interested in maximizing utility.

Finally, despite the “proof” of discrimination offered by some sociologists (which in turn provides the justification for governmental intervention), market discrimination against women cannot be shown to be the primary cause of the gender wage difference. As mentioned earlier, men and women bring many differences to the labor market that are simply unmeasurable, and not all studies point directly to discrimination. For example, Paglin and Rufolo (1990) have a plausible quantitative ability theory. Blau and Kahn (2000) suggest overall income inequality in the United States plays an important role. Solberg (2004) finds very little hiring discrimination, and other studies have observed similar pay for men and women when it is broken down into the same highly detailed occupation. “The College Placement Council data show that the mean starting salaries for males and females in each narrowly defined field are very close. The unweighted average in all fields shows females earning 97.3% of male salaries” (Paglin and Rufolo 1990).

CHAPTER 4 - Policy Recommendations and Their Implications

Existing anti-discrimination laws include the Equal Pay Act of 1963, which guarantees equal pay for equal work, and Title VII of the Civil Rights Act of 1964, which prohibits sex-based employment discrimination.

The studies on the gender earnings gap (while varied, contradictory, and inconclusive) serve as positive substantiation for the normative underlying question: should the government play a larger role in employment regulation? Some conclude “yes,” others answer “no.” Even for those who can agree on “yes,” the proper effective policy is also debatable. The following section will address some suggested policy changes.

Comparable Worth

The term “comparable worth” is a vague concept and its exact meaning is difficult to define. In general, comparable worth is a proposed remedy for the earnings differential between “male jobs” and “female jobs.” Comparable worth policies seek to classify jobs on the basis of several characteristics (skill level, working conditions, etc.) and ensure that comparable jobs

requiring comparable labor will receive equal pay. This usually means that wages would need to be increased for the comparable female-dominated jobs.

Bergmann (1989) and England, Reid, and Kilbourne (1996) support the argument for “comparable worth” policies. They suggest that these policies are needed to alleviate discrimination, particularly the issue of employers setting lower wages when the job is filled largely by women. A job evaluation based on a point system could examine several categories: knowledge and skills, mental demands, accountability, and work conditions. For example, the State of Washington conducted evaluations on several occupations in 1974, and their total points compared to salary are shown in the table below (Bergmann 1989, p. 56).

Table 4.1: Sample Point System for Comparable Worth

Occupation	Knowledge and Skills	Mental Demands	Accountability	Work Conditions	Total Points	Salary (in 1985)
Delivery Truck Driver	61	10	13	13	97	\$382
Auto Mechanic	106	26	30	13	175	\$465
Secretary	122	35	40	0	197	\$306
Civil Engineer	160	53	61	13	287	\$513
Registered Nurse	184	70	70	17	341	\$411

Source: State of Washington Comparable Worth Study, 1974.

However, while the intent of comparable worth policies may be admirable, the actual outcome could be problematic. In an article for the *Monthly Labor Review* titled “Comparable Worth: How Do We Know It Will Work?” Carolyn Bell (1985) gives a short answer: we don’t.

We are completely unable to predict the outcomes of an effective comparable worth policy, whether mandated by law or adopted by private decision makers. Our ignorance stems from the lack of data with which to build a viable economic model...Comparable worth has frequently been proposed as a solution without clearly defining the problem, partly because of insufficient data, and partly because of insufficient analysis of existing data. (Bell 1985, p. 5)

The first problem to arise might be determining exactly what percentage of workers in an occupation must be of the same sex for it to be classified as a sex-typed job. Secondly, policymakers (rather than the market) will be trying to define some sort of “just price.” “This

argument comes close to implying that work has an intrinsic or innate value, quite apart from the monetary wage it commands in the labor market. Such a notion is neither statistically demonstrable nor part of any economic theory” (Bell 1985, p. 7). Even if comparable wages can be determined and agreed upon for certain occupations, the implementation of those wages will interfere with existing market forces. For example, suppose a job evaluation system suggests that secretaries should be paid the same wage as auto mechanics. A higher wage for secretaries could lead to a surplus of labor in that market and a shortage of labor in the auto mechanic market. Then the only way to obtain more auto mechanics would be to offer a pay premium for that job. However, if that happens and more men become auto mechanics, the original problem returns where males are earning more than females.

Furthermore, while there may be some benefits of comparable worth policies, there would also be costs. Explicit costs would likely come in the form of increased labor costs for firms in the job categories most affected by a comparable worth wage increase. Increased labor costs could result in higher prices and more unemployment in those markets. Implicit costs could include the perpetuation of occupational sex segregation. Females would have a reduced incentive to enter the traditionally male occupations.

Stricter Anti-Discrimination Laws

Although anti-discrimination laws do exist, many argue that it is not enough to address the problem of gender discrimination in the labor market. If barriers to entry are preventing women from entering “male” occupations, governmental intervention may be needed to break down those barriers. If hiring discrimination is the problem, affirmative action may be a solution.

Affirmative action is a policy designed to increase the representation of women or minorities. Executive Order 11246 (passed in 1965) requires most companies doing business with the federal government to statistically analyze their workforce and identify any areas in which women are significantly underrepresented. Affirmative action plans set forth specific goals and timetables for increasing the employment of women in those areas. Companies failing to comply with affirmative action plans can lose government contracts or be banned from receiving future contracts (Ragan and Thomas 1993, p. 462).

Solberg (1999) believes that because there is relatively little hiring discrimination, public policy directed at breaking down barriers to entry will be ineffective.

Since the estimated gap is similar when aspirations and actual occupations are used, a vigorously enforced public policy, directed toward the elimination of the gender gap by eliminating hiring discrimination, might be ineffective. Public policy directed toward a vigorous enforcement of law that prohibits discriminatory differences in pay may more effectively reduce the remaining discriminatory part of the pay gap. (Solberg, 1999, p 100)

Therefore, if barriers to entry are not a significant problem, affirmative action is not an effective solution. However, if gender pay discrimination is not clearly evident, then comparable worth policies are not a useful solution either. The trouble with finding a good “solution” is determining the exact “problem.” Hence, if the causes of the gender wage gap are still being debated, the proper public policy response will also be uncertain.

CHAPTER 5 - Conclusion

The issue of the gender earnings gap is multi-dimensional and highly complex. Various economic and sociological studies seem to contradict each other, particularly because “discrimination” is impossible to measure directly. However, the vast literature on the subject has lead to some conclusions.

- The gender pay ratio has improved substantially in recent decades.
- Men and women participate differently in the labor market.
 - Women are more likely to have intermittent employment.
 - Women are more concentrated in the lower paying occupations.
- The earnings gap between men and women likely reflects a combination of differences in human capital, occupational field, societal responsibilities, and social norms.

Despite the large number of studies on the gender earnings gap, certain questions remain.

- How much of the earnings difference is related to preference and choice?
- How much of the difference is caused by pre-market discrimination?
- Do women experience a significant amount of current market discrimination?
- Should the government play a larger role in the equalization of pay in the labor market?
- What types of policies, if any, would decrease discrimination without disrupting equilibrium in the labor market?
- Is more research needed on this issue, or is it something that can never be resolved?

The disagreement among economists and sociologists is a result of elusive data and differing opinions. George Bernard Shaw may be right, and a definitive conclusion about the gender earnings gap will never be reached.

References

- Alkadry, Mohamad G., and Leslie E. Tower.** “Unequal Pay: The Role of Gender.” *Public Administration Review*, Vol. 66, No. 6. (Nov/Dec 2006), pp. 888-898.
- Bell, Carolyn Shaw.** “Comparable Worth: How Do We Know It Will Work?” *Monthly Labor Review*, (December 1985). pp. 5-12.
- Bergmann, Barbara.** “Does the Market for Women’s Labor Need Fixing?” *The Journal of Economic Perspectives*, Vol. 3, No. 1. (Winter, 1989), pp. 43-60.
- Blau, Francine D., and Lawrence M. Kahn.** “Gender Differences in Pay.” *The Journal of Economic Perspectives*, Vol. 14, No. 4. (Autumn, 2000), pp. 75-99.
- Budig, Michelle J., and Paula England.** “The Wage Penalty for Motherhood.” *American Sociological Review*, Vol 66, No. 2. (April 2001), pp. 204-225.
- Council of Economic Advisors.** “Report: Explaining Trends in the Gender Wage Gap.” (June 1998).
- Crittenden, Ann.** *The Price of Motherhood*. Henry Holt and Company, LLC. 2001.
- Crittenden, Ann.** Interview. <http://www.anncrittenden.com> (2001).
- England, Paula.** “Gender Inequality in Labor Markets: The Role of Motherhood and Segregation.” *Oxford University Press Journals*. (Summer 2005), pp. 264-288.
- England, Paula; George Farkas, Barbara Stanek Kilbourne, and Thomas Dou.** “Explaining Occupational Sex Segregation and Wages: Findings from a Model with Fixed Effects.” *American Sociological Review*, Vol. 53, No. 4. (August 1988), pp. 544-558.
- England, Paula; Lori L. Reid; Barbara Stanek Kilbourne.** “The Effect of the Sex Composition of Jobs on Starting Wages in an Organization: Findings from the NLSY.” *Demography*, Vol. 33, No. 4. (November 1996), pp. 511-521.
- Ginther, Donna K., and Shulamit Kahn.** “Women in Economics: Moving Up or Falling Off the Academic Career Ladder?” *The Journal of Economic Perspectives*, Vol. 18, No. 3. (Summer 2004), pp. 193-214.

- Goldin, Claudia, and Cecilia Rouse.** “Orchestrating Impartiality: The Impact of ‘Blind’ Auditions on Female Musicians.” *The American Economic Review*, Vol.90, No. 4. (September 2000), pp. 715-741.
- Neumark, David; Roy J. Bank; Kyle D. Van Nort.** “Sex Discrimination in Restaurant Hiring: An Audit Study.” *The Quarterly Journal of Economics*, Vol. 111, No. 3. (August 1996), pp. 915-941.
- Miller, Amalia R.** “The Effects of Motherhood Timing on Career Path.” University of Virginia Working Paper. (August 2006).
- Mincer, Jacob, and Haim Ofek.** “Interrupted Work Careers: Depreciation and Restoration of Human Capital.” *The Journal of Human Resources* 17. (1982), pp. 3-24.
- Mincer, Jacob and Solomon Polachek.** “Family Investments in Human Capital: Earnings of Women.” *The Journal of Political Economy*, Vol. 82, No. 2. (Mar/Apr 1974), pp. 76-108.
- Paglin, Morton, and Anthony M. Rufolo.** “Heterogeneous Human Capital, Occupational Choice, and Male-Female Earnings Differences.” *Journal of Labor Economics*, Vol. 8, No. 1. (January 1990), pp. 123-124.
- Polachek, Solomon William.** “Occupational Self-Selection: A Human Capital Approach to Sex Differences in Occupational Structure.” *The Review of Economics and Statistics*, Vol. 63, No. 1. (February 1981), pp. 60-69.
- Public Broadcasting System.** “Taking the Heat.” *Independent Lens Production*.
<http://takingtheheat.com> (1993).
- Ragan, James F., and Lloyd B. Thomas.** Principles of Microeconomics. 2nd Edition. The Dryden Press. 1993.
- Solberg, Eric J.** “Occupational Assignment, Hiring Discrimination, and the Gender Pay Gap.” *Atlantic Economic Journal*, Vol. 32, No.1. (March 2004), pp. 11-26.

Solberg, Eric J. “Using Occupational Preference in Estimating Market Wage Discrimination: The Case of the Gender Pay Gap: Decomposition of a Reduced-Form Wage Equation.” *American Journal of Economics and Sociology*, Vol. 58, No. 1. (January 1999), pp. 85-113.

U.S. Bureau of Labor Statistics. *American Time Use Survey*. (2006).

U.S. Bureau of Labor Statistics. *Employment and Earnings*. (January 2008), Vol 55, No. 1.

U.S. Bureau of Labor Statistics. *Highlight of Women’s Earnings in 2006*. (September 2007).

U.S. Bureau of Labor Statistics. *Women in the Labor Force: A Databook*. (September 2007).

U.S. Census Bureau. *Current Population Survey*. (2006).

U.S. Census Bureau. *Current Population Survey*. (2007).

U.S. Census Bureau. *Panel of Program Participation*. (2004)