2005

Where Supply Meets Demand: Women in Diesel Mechanics

Emily Raine
University of Kentucky

Recommended Citation

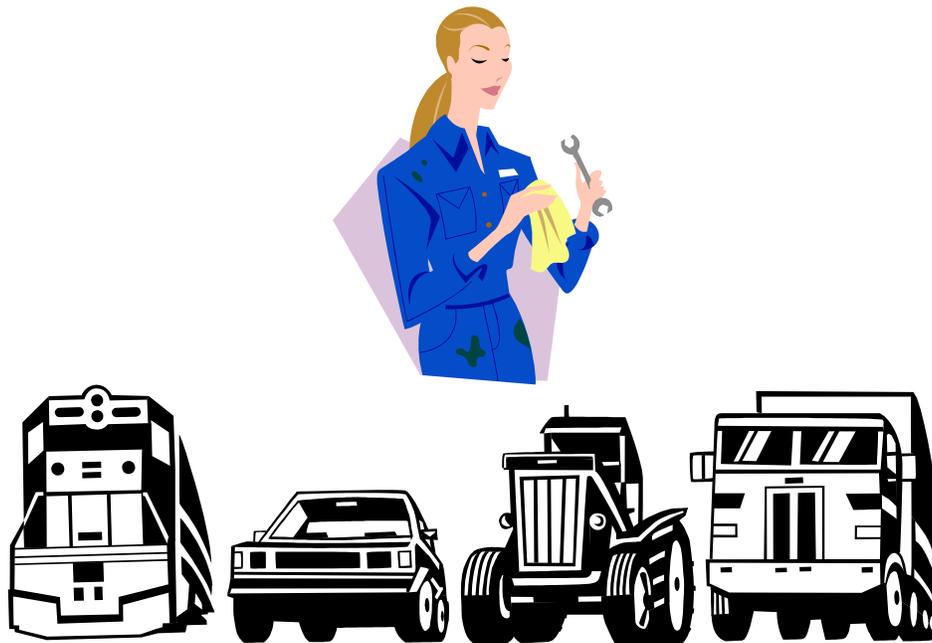Raine, Emily, "Where Supply Meets Demand: Women in Diesel Mechanics" (2005). *MPA/MPP/MPFM Capstone Projects*. 81.
https://uknowledge.uky.edu/mpampp_etds/81

Where Supply Meets Demand: Women in Diesel Mechanics

Emily Raine
Martin School of Public Policy and Administration
University of Kentucky
November 28, 2005

Committee:
Dr. Colleen Heflin
Dr. Ed Jennings
Dr. Richard Fording

Table of Contents

Executive Summary

In 2004, with a participation rate of 59.2 percent, women represented 46 percent of the total U. S. labor force.[1] This same year, women earned an average of $573 per week, approximately 80 percent of men's median weekly earnings. It is rarely disputed that a gender wage gap exists; rather it is the cause of this differential that is often the subject of debate. Empirical evidence indicates that the wage differential can be attributed to factors such as differences in education, labor market experience, and occupational choice.

Research has consistently shown that increases in educational attainment will lead to positive labor market returns. However, such positive returns to education are not always the same for women and men. For example, a stark contrast exists between the earnings of women and men who have earned a vocational or technical certificate or degree. This can be attributed to a high level of occupational differentiation by gender among those with an associate's degree (61.1 percent) (Wootten, 1997, 18). Women remain clustered in traditionally female educational programs such as childcare, administrative assistance, nursing assistance, and cosmetology. These low-wage careers offer few opportunities for advancement and make the prospect of economic security and self-sufficiency quite difficult. Men who enter vocational or technical programs, however, enroll in programs that lead to higher wage careers in which true economic self-sufficiency is an attainable goal.

Historically, the increase in pay equity between men and women can be linked to the increase in women's access to traditionally male jobs (Cohn, 2001, 121). The intersection between the gender pay gap and occupational segregation by gender is one that deserves further exploration. However, it is not certain whether the pursuit of non-traditional jobs by women will

---

[1] U.S. Department of Labor, Bureau of Labor Statistics. "Quick Stats 2004." http://www.dol.gov/wb/stats/main.htm.

guarantee that they will earn a wage equivalent to that of their male counterparts. Sex discrimination within the field, evidenced by an unequal wage, may act as a barrier for a woman's entry.

Exploring whether female workers earn less than comparable male workers within the same narrowly defined occupational category will have potential implications for the promotion of women into non-traditional occupations. The profession chosen to be analyzed in terms of the equality of wages between its male and female workers was diesel mechanics, a male dominated occupation that currently maintains a steady level of demand and pays a good wage.[2]

In 2004, there were 325,000 workers employed as bus and truck mechanics and diesel mechanic specialists, 2,000 of which were women (0.6 percent).[3] According to the U.S. Department of Labor, this is one of the most gender segregated occupations in the country. Over the past decade, companies across the nation have struggled to recruit and retain qualified and experienced diesel technicians. It is estimated that the nation is suffering from a shortage of up to 45,000 diesel technicians (Kelley, 2001, 26). If the number of diesel technicians entering the workforce continues to decline, it will present a significant problem. The demand for diesel technicians provides an excellent opportunity for women to enter the field. While women search for higher paying jobs and employers of diesel technicians search for qualified help, a potential connection between the two could be made. Exploring the wage differential between men and women in this profession may suggest why the supply of female diesel technicians remains low. Evidence of a wage gap, or lack thereof, will suggest possible policy implications for addressing the diesel technician shortage.

---

[2] For the purpose of this research, the term "diesel mechanics" will refer to the profession itself while the term "diesel technician" will refer to the worker employed in this profession.

[3] U.S. Department of Labor, Bureau of Labor Statistics. "Nontraditional Occupations for Women in 2004." Current Population Survey. Unpublished data. Retrieved August 25, 2005, from http://www.dol.gov/wb/factsheets/nontra2004.htm.

Based on prior research regarding the existence of the gender wage gap, the hypothesis that will be tested in this analysis is, "Employed as bus and truck technicians or diesel engine specialists, women earn a statistically significant lower hourly wage than men." If the hypothesis holds, it will suggest a potential barrier for women's entry into this occupation. If the hypothesis is rejected, it will suggest a potential point of interest in introducing women into the field of diesel mechanics.

A quantitative research analysis was designed to investigate the research question. To analyze the wage differential between men and women, a multiple regression analysis was conducted. This statistical tool was used to explore the relationship between hourly wage and gender, while controlling for additional explanatory variables. Education, race, region, number of hours worked, labor market experience are examples of variables that were included in the regression equation.

The sample was drawn from the 5 percent sample of the United States Census 2000. The dependent variable was the natural logarithm of hourly wage. The analysis included a carefully selected group of independent variables. The explanatory variables that were chosen to be included in the regression model were as follows: age, sex, educational attainment, Hispanic or Latino origin, marital status, race, potential work experience, and region of the country in which the respondent worked.

According to the adjusted R-squared value, only 6.3 percent of the variation in hourly wage in the sample could be explained by the independent variables. This is quite low and it indicates that the wage of diesel technicians is correlated to some other factor or factors, such as productivity or experience within the field of diesel mechanics, which were not captured by the regression equation. Of the independent variables, using a 95 percent confidence level, all were

statistically significant with the exception of sex, race, and potential work experience. Therefore, based on the sample, sex was not a statistically significant predictor of the variance in hourly wage.

The creation of interaction terms to be included in a second regression model provided a more accurate estimation of the relationship between the independent and dependent variables. An interaction term is simply a variable representing the product of two explanatory variables from the multiple regression model. In this case, two different variables were interacted with sex. The new variables were the interaction between having a high school degree and sex ("hsedxsex") and the interaction between having greater than a high school degree and sex ("highedxsex"). The creation of these variables allowed for the effects of gender on hourly wage to change as the level of educational attainment changes.

According to the regression output, at the .05 level, the interaction between sex and earning a high school degree is not a statistically significant predictor of the variance in hourly wage. In this sample, the returns to a high school degree, in terms of hourly wage, do not vary by gender. The interaction between educational attainment above a high school degree and sex is also not correlated to hourly wage at the .05 level. However, the p-value of .065 indicates that there is a marginally significant difference in hourly wage for men and women who have attained an education above a high school degree. Using a 90 percent confidence interval (p-value ≤.10), the effect of high educational attainment on hourly wage varies according to the gender of the worker. The positive coefficient on the variable "highedxsex" indicates that women who pursue degrees above the high school level can expect to get greater returns, in terms of hourly wage, than men. This is encouraging for women who seek higher education in that they can expect a smaller gender wage differential as their level of education increases.

Following the discussion of the limitations to this research, recommendations based on the findings of this analysis can be made. Disseminating the information that women earn an equal wage in the traditionally male dominated occupation of diesel mechanics is crucial. Recruitment of women to the field of diesel mechanics can begin with letting women know that the data shows that there is not a statistically significant difference between the average male and female wage.

Since the enactment of Temporary Assistance to Needy Families (TANF), the welfare reform act of 1996, employment among single mothers has increased (Meyer, 1999). The goal of TANF is for recipients to achieve self-sufficiency and economic security through work. The potential exists for a powerful connection to be made between TANF's welfare to work programs and women's entry into nontraditional occupations such as diesel mechanics. Women moving from welfare to work are looking for job security and a steady wage, characteristics of the skilled-trade professions (Borrego, 2002, 30). The evidence provided does support the notion that diesel mechanics is a potential profession for women in which they can expect to earn a wage comparable to that earned by a man.

Further research that explores wage differentials in other male dominated occupations would allow for conclusions to be drawn regarding the relationship between women and wages in nontraditional occupations. Even though gaining entry into nontraditional jobs may be difficult for women, perhaps once they are trained and educated, they can expect a wage equal to that of their male counterparts. This could be a great incentive for women to pursue nontraditional occupations. A broader study of women's wages in nontraditional occupations is necessary to shed more light on this issue. What can be derived from this research is that the

evidence provided does support the notion that diesel mechanics is a potential profession for women in which they can expect to earn a wage comparable to that earned by men.

Review of the Literature: The Gender Pay Gap

In 1963, President Kennedy signed the Equal Pay Act into law, making it illegal to pay men and women employed in the same establishment different wages for equal work. Although the gap in average pay between men and women has since decreased, the U. S. is still a long way from gender wage equality (Council of Economic Advisors, 1998). The historical factors that have shaped the social, cultural, and economic position of women must be taken into account to conceptualize why the gender wage gap exists. Though the existence of a wage differential between men and women is rarely disputed, the cause of this differential is often the center of contentious debate. Empirical evidence indicates that the wage differential can be attributed to factors such as differences in education, labor market experience, and occupational choice.

Over the past twenty to thirty years, women have entered the labor market rapidly and the gender wage gap has narrowed (Blau, 2000, 78). An increase in new entries to the labor market has affected the gap in experience between men and women. This is especially true for older women; thus the gender wage ratio tends to decline with age (Blau, 2000, 77; Council of Economic Advisors, 1998, 5). In 2004, with a participation rate of 59.2 percent, women represented 46 percent of the total U. S. labor force.[4] This same year, women earned an average of $573 per week, which equaled approximately 80 percent of men's median weekly earnings.

Women have not had the same opportunity as men to gain experience and develop an employment history in their chosen profession. The disparity in experience is in part a result of the greater tendency of women to remove themselves from the labor market at some point in their lives to fulfill familial obligations. A report issued in 1998 by President Clinton's Council of Economic Advisors states, "children are associated with lower wages for women but not for

---

[4] U.S. Department of Labor, Bureau of Labor Statistics. "Quick Stats 2004." http://www.dol.gov/wb/stats/main.htm.

men, in part because children tend to reduce women's work experience and time with their

employer." Women have usually spent some period of time in the labor market when they leave

to raise their children, so interruptions in their work history are common.

In 1996, women had been with their current employer fewer years than men in virtually

every age group (Economic Policy Foundation, 1998). In Figure 1, data collected from the Panel

Study of Income Dynamics depicts the average years of work experience and average hours

worked per year for males and females.

Figure 1: Average Years of Work Experience and Average Hours Worked per Year for Males and Females
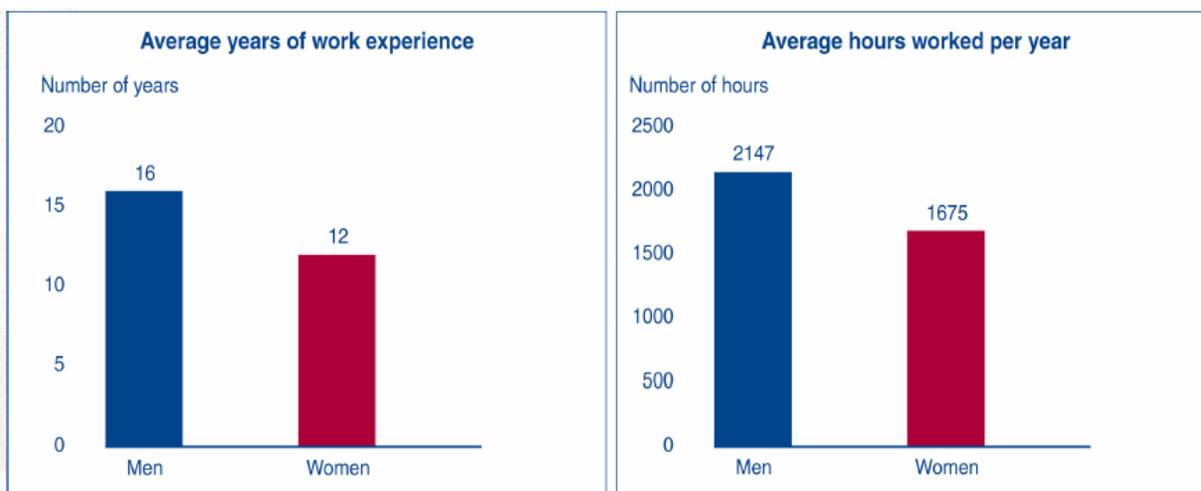
Source: U.S. General Accounting Office. 2003. "Women's Earnings: Work Patterns Partially Explain Difference Between Men's and Women's Earnings." Retrieved August 25, 2005, from http://www.gao.gov/new.items/d0435.pdf. 10.

In the past twenty years, the educational attainment of women has increased dramatically.

According to the U.S. Bureau of Labor Statistics, in 2004, the college enrollment rate of women,

71.6 percent, was higher than that of men, 61.4 percent.[5] This is a relatively new development;

consequently, many older female workers still struggle to compete for jobs with men who have a

---

[5] U.S. Department of Labor, Bureau of Labor Statistics. 2005. "College Enrollment and Work
Activity of 2004 High School Graduates." Retrieved August 25, 2005, from
ttp://www.bls.gov/news.release/hsgec.nr0.htm.

disproportionately higher level of educational attainment. As older workers retire and today's

educated youth move into the labor market, the wage gap should narrow.

Research has consistently shown that increases in educational attainment will lead to

positive labor market returns. In 1996, 30 percent of adults without a high school degree were

employed while 70 percent of adults with some college education and/or post-secondary

vocational certificates were employed (Levesque, 2000, 26). The U.S. Census Bureau reports

that in 2002, women with an associate's degree earned almost twice as much as those without a

high school diploma.[6] Additional research has shown that students who earn a post-secondary

vocational degree earn an average of 38 percent more than students with a high school degree

(Goodwin, 2004, 12).

The U.S. Department of Education indicates that enrollment in post-secondary vocational

schools is declining. Many attribute this to the pressure on high school graduates to attend

college and earn a Bachelor's degree. Vocational and technical education has been stigmatized as

a career path for underachievers. Both parents and educators share the blame in promulgating

this message (*Heavy Duty Trucking*, 1998; Bendel, 2000, 3). Though many students still choose

not to pursue a Bachelor's degree, other post-secondary educational options are no longer

actively promoted within secondary schools.

More than thirty years ago, Title IX of the Education Amendments was passed into

federal law prohibiting sex discrimination in all federally funded education programs.

Unfortunately, the enrollment in vocational and technical programs by gender today is quite

similar to that which existed prior to passage of Title IX. There are several factors that contribute

to the continued gender segregation of vocational and technical programs. Such factors include

---

[6] According to the U.S. Census Bureau, of full-time working women between the ages of 24 and 65, those with an associate's degree earned an average of $31,193 per year while those without a high school degree earned an average of $17,124 per year.

biased counseling, incomplete information about the future implications of career training choices, sexual harassment of women who enroll in nontraditional classes, and the erroneous notion that women cannot excel at physically demanding jobs (National Women's Law Center, 2002).

Education is highly correlated to occupational segregation by gender. Identifying the level at which the greatest occupational segregation between women and men occurs is key in addressing the gender wage gap. The higher the education attained, the smaller the occupational differences between the sexes (Wootten, 1997, 15). For example, the lowest level of occupational differentiation by gender is among college graduates who have earned a professional degree (18.2 percent) while the highest level of occupational differentiation is among those with an associate's degree (61.1 percent) (Wootten, 1997, 18).

The differences in occupational choice between men and women make gender segregation a significant feature of the labor market. Placed within a historical context, the rise of traditionally female and traditionally male occupations can be better understood. The division of labor between women and men is deeply rooted in U.S. history. When women started entering the paid labor force, they often took jobs that required tasks with which they were familiar. Women were discouraged from taking jobs that were considered more suitable for men and responded by carving out their own niche in the labor market in female dominated occupations.

There are several occupations that are predominately filled by one gender more than the other. For example, almost 80 percent of administrative support workers are women while 91 percent of workers in the precision production, craft, and repair occupations are men (Economic Policy Foundation, 1998). Surprisingly, women have had much more success in entering historically male white-collar and service occupations than in blue-collar occupations (Blau,

2000, 80). Jobs that are male dominated are considered nontraditional occupations for women.[7]

Nontraditional jobs may appeal to women because they usually offer much higher entry-level

wages and more room for advancement. As more females enter traditionally male dominated

occupations, it is fair to assume that the wage differential will decrease.

Women remain clustered in traditionally female educational programs such as childcare,

administrative assistance, nursing assistance, and cosmetology. These low-wage careers offer

few opportunities for advancement and make the prospect of economic security and self-

sufficiency quite difficult. Men who enter vocational or technical programs, however, tend to

enroll in programs that lead to higher wage careers in which true economic self-sufficiency is an

attainable goal. According to the Women's National Law Center, a leading advocate for

occupational gender desegregation,

> "Segregating female students into traditionally female programs severely compromises
> their future ability to support themselves and their families due to significant pay
> disparities between traditionally female and traditionally male occupations. In addition,
> young women in traditionally female programs often receive inferior educations, with
> less access to math, science and special technology programs." (2002)

Figure 2 indicates the percentage of each gender enrolled in a selection of vocational and

technical courses based on data from the Departments of Education in twelve states. The

segregation of vocational and technical programs by gender is overwhelmingly clear.

---

[7] For the purpose of this research, a nontraditional occupation for women is one in which women comprise 25
percent or less of total employment.

Figure 2: National Patterns of Gender Segregation in Selected Vocational and Technical Courses Based on Data in 12 Regions
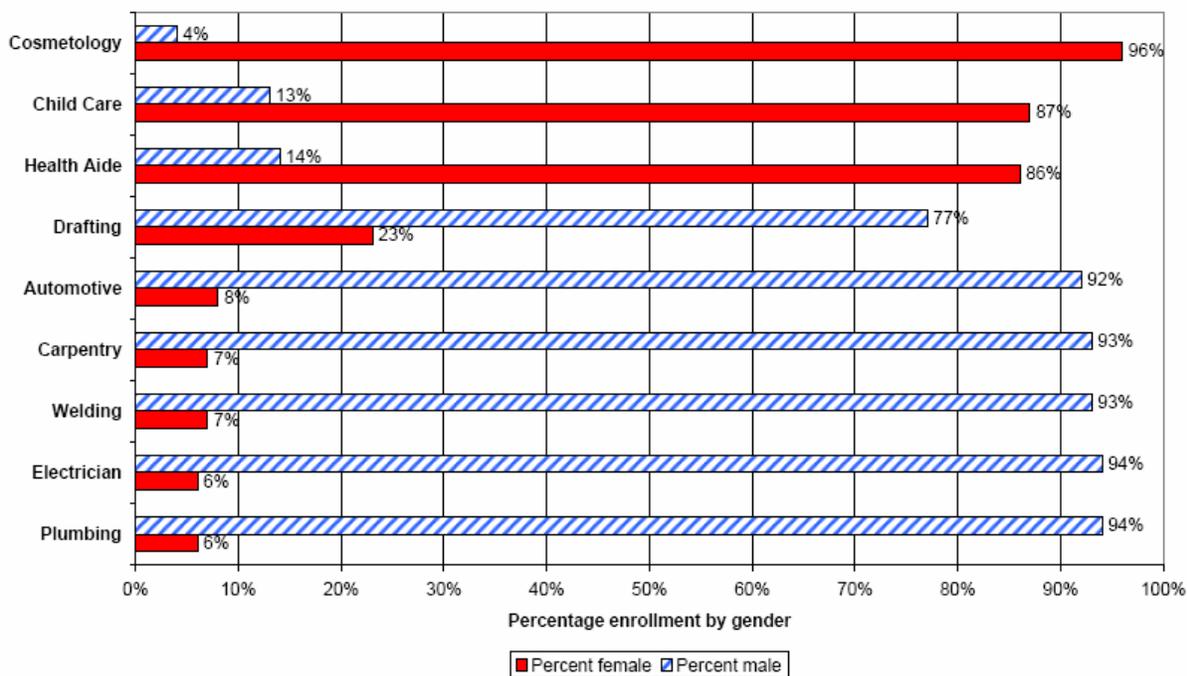
Wage data provided by the U.S. Department of Labor defines the dramatic wage discrepancy between traditionally female occupations and traditionally male occupations. According to the Department of Labor, in 2002, students entering childcare work earned a median hourly wage of $7.86; those seeking employment as nursing aides earned a median hourly wage of $9.59; finally, cosmetologists earned a median hourly wage of $9.52. By contrast, in 2002, median hourly earnings of plumbers, pipefitters, and steamfitters were $19.31; the highest paid workers earned more than $32.27 per hour. Similarly, electricians' median hourly earnings were $19.90 per hour; some earned an hourly wage of $33.21 or higher. The median hourly earnings for students who became diesel technicians was $16.53. The highest 10 percent of these workers earned more than $24.61 an hour. Figure 3 provides wage information

for six different occupations whose workers are either predominately male or female. The

median wage for the highest paid 10 percent of workers, the overall median wage, and the

median wage of the lowest paid 10 percent of workers are provided for each occupation.

Figure 3: The Average Wage of the Highest Paid 10%, the Median Wage, and the Average Wage of the Lowest Paid 10% in Selected Traditionally Male and Traditionally Female Occupations
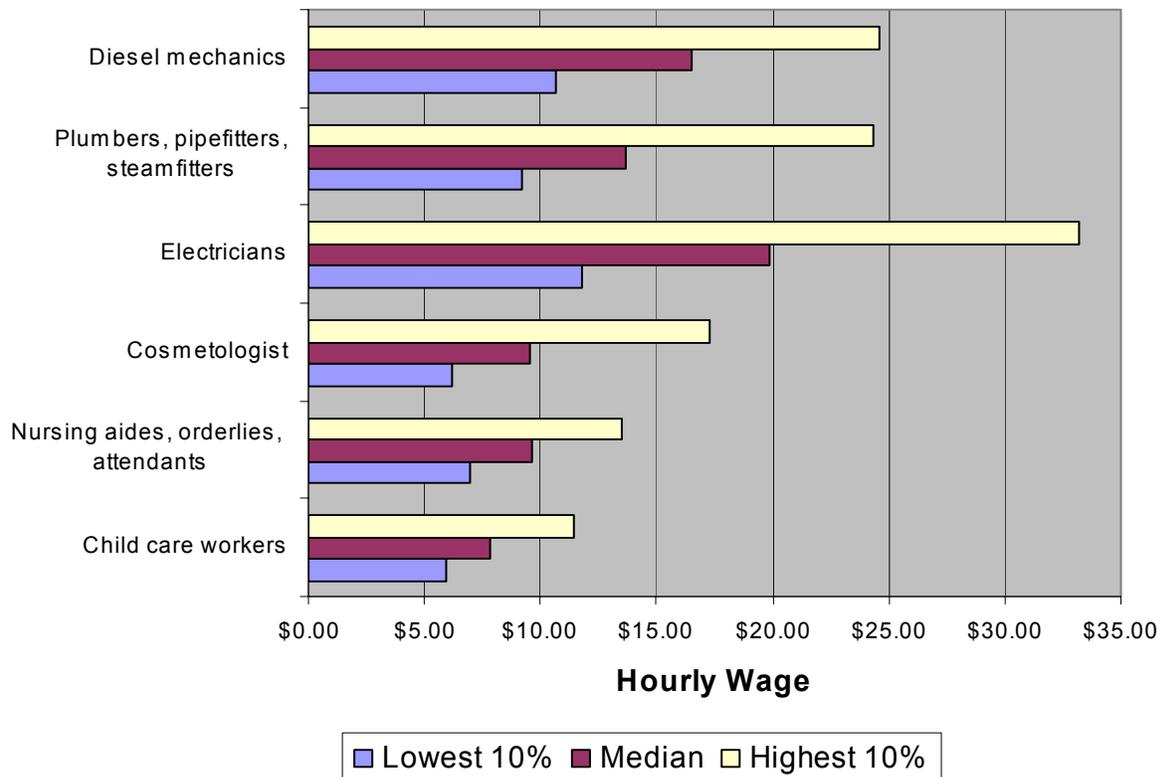
Source: U.S. Department of Labor, Bureau of Labor Statistics. 2005. *Occupational Outlook Handbook, 2004-05 Edition.* **Retrieved October 18, 2005, from http://www.bls.gov/oco/home.htm**.

Astonishingly, the amount earned by the top 10 percent of workers in the predominantly

female occupations of nursing aide or child care worker was less than the median wage earned

by those employed in the three predominantly male occupations shown in Figure 3. Furthermore,

the top 10 percent of child care workers earned approximately 30 percent less than the median

amount earned by diesel technicians.

The stark contrast between the earnings of women and men who have earned a vocational or technical certificate or degree is astounding. It perpetuates a vicious cycle of inequality that must be addressed. Unfortunately, to date, it has garnered little public attention. At a time when poverty among single mothers stands at approximately 28 percent, it is imperative that women gain access to jobs that pay higher wages (DeNavas-Walt, 2005, 11). In general, men receive higher wages than women in the jobs for which they are trained in vocational school. Historically, an increase in pay equity between men and women can be linked to an increase in women's access to traditionally male jobs (Cohn, 2001, 121). The intersection between the gender pay gap and occupational segregation by gender is one that deserves further exploration. According to the U.S. Department of Labor, many traditionally male jobs are expected to experience large growth over the next ten years. Without women as potential applicants, the pool from which to draw employees is virtually cut in half. Perhaps the threat of a labor shortage will encourage the promotion of women into nontraditional occupations. However, it is unclear whether the pursuit of nontraditional jobs by women will guarantee that they will earn a wage equivalent to that of their male counterparts. Sex discrimination within the field, evidenced by an unequal wage, may act as a barrier for a woman's entry.

The percentage of women who work in traditionally male-dominated occupations is quite low; however, there are still enough women who have boldly entered these fields for data to be collected on their wages. Armed with this data, conclusions can be drawn as to whether a gender pay differential exists in one nontraditional occupation. Exploring whether female workers earn less than comparable male workers within the same narrowly defined occupational category will have potential implications for the promotion of women into nontraditional occupations.

Review of the Literature: Diesel Mechanics

The profession chosen to be analyzed in terms of the equality of wages between its male and female workers was diesel mechanics, a male dominated occupation that currently maintains a steady level of demand and pays a good wage.[8] In order to provide an appropriate foundation for the forthcoming analysis, the skilled trade of diesel mechanics will be introduced.

Diesel technicians repair and maintain diesel engines that power transportation and construction equipment such as heavy trucks, buses, locomotives, bulldozers, cranes, road graders, farm tractors, and combines. In 2004, there were 325,000 workers employed as bus and truck mechanics and diesel mechanic specialists, 2,000 of whom were women (0.6 percent).[9] According to the U.S. Department of Labor, this is one of the most gender segregated occupations in the country.

The *U.S. Department of Labor Occupational Outlook Handbook 2004-05 Edition* reports that job opportunities are expected to be good for persons who complete formal training programs in diesel mechanics. Community colleges, junior colleges, trade schools, and vocational or technical schools offer formal training in diesel mechanics. Programs range in length from six months to two years and usually lead to a certificate of completion or an associate's degree. The standard of achievement for the diesel technician is certification by the National Institute for Automotive Service Excellence (ASE).

Over the past decade, companies across the nation have struggled to recruit and retain qualified and experienced diesel technicians. A 2001 survey conducted by *Commercial Carrier Journal* reported that 75 percent of industry professionals believed that the shortage of

---

[8] For the purpose of this research, the term "diesel mechanics" will refer to the profession itself while the term "diesel technician" will refer to the worker employed in this profession.

[9] U.S. Department of Labor, Bureau of Labor Statistics. "Nontraditional Occupations for Women in 2004." Current Population Survey. Unpublished data. Retrieved August 25, 2005, from http://www.dol.gov/wb/factsheets/nontra2004.htm.

technicians had remained the same or gotten worse over the past year. It is estimated that the nation is suffering from a shortage of up to 45,000 diesel technicians (Kelley, 2001, 26).

If the number of diesel technicians entering the workforce continues to decline, it will present a significant problem. A market in which demand for labor is greater than supply threatens the stability of the economy. Companies may be forced to hire individuals without the appropriate experience and education because the pool from which to draw employees is so small. When companies are forced to compete for labor, they must use techniques to entice prospective employees to join their workforce. In most cases financial incentives are provided, thus increasing labor costs for the company. The increase in labor costs is usually passed on to the primary consumer. If the primary consumer is the first in a chain of consumers, the cost will be passed on to each consecutive consumer. As a result of this ripple effect, the economy may suffer (Chandrasekaran, 1997, A01).

The need for diesel technicians is expected to grow as freight transportation by truck increases. An increase in the production of goods demands a greater number of trucks for local and intercity hauling. In today's economy, when a sector experiences growth it usually requires an increase in transportation (Rust, 2003, 2). A great deal of literature identifies the trucking industry as one of the dominant areas where labor shortages continue to grow. If the trucking industry continues to experience growth, it is logical to expect that more diesel technicians will be needed. Trucks cannot run if they have not been properly maintained, therefore the survival of the trucking industry relies heavily on qualified diesel technicians to maintain its fleets (Goldfisher, 1998).

Many factors contribute to the shortage of diesel technicians: an aging workforce, failure of the trucking industry to recruit and retain technicians, poor image of diesel technicians and

vocational programs, unattractive working conditions, perception that pay is low, lack of joint recruitment effort among all diesel industries, under-equipped training institutions offering outdated programs, and lack of a national apprenticeship program (Skipper, 1996, 39). During the 1980's, the advent of electronic engines discouraged many from entering the field. Prospective students found these new tasks to be too daunting and moved into fields with less demanding skill sets. The negative image that has stigmatized the profession is that of the "grease monkey" (*Heavy Duty Trucking,* 1998). The age of computer and technological advancements compounded this problem as many moved to "cleaner" professions.

The demand for diesel technicians provides an excellent opportunity for women to enter the field. While women search for higher paying jobs and employers of diesel technicians search for qualified help, a potential connection between the two could be made. Exploring the wage differential between men and women in this profession may suggest why the supply of female diesel technicians remains low. Evidence of a wage gap, or lack thereof, will suggest possible policy implications for addressing the diesel technician shortage.

Based on prior research regarding the existence of the gender wage gap, the hypothesis that was tested in this analysis was, "Employed as bus and truck technicians or diesel engine specialists, women earn a statistically significant lower hourly wage than men." If the hypothesis holds, it will suggest a potential barrier for women's entry into this occupation. If the hypothesis is rejected, it will suggest a potential point of interest in introducing women into the field of diesel mechanics.

Methodology

A quantitative research analysis was designed to investigate the research question. To analyze the wage differential between men and women, a multiple regression analysis was conducted. This statistical tool was used to explore the relationship between hourly wage and gender while controlling for additional explanatory variables. Multiple regression is useful in determining whether a particular effect is present and in measuring the magnitude of that effect (Rubinfeld, 2000, 181). The regression analysis allows for several variables thought to influence earnings to be correlated to individuals' hourly wages in order to determine whether there is a statistically significant difference in the wages of male and female diesel technicians. Education, race, region, number of hours worked, and labor market experience are examples of variables that were included in the regression equation.

The statistical analysis was performed using STATA, Version 8.0. The sample was drawn from the 5 percent sample of the United States Census 2000. The Census was chosen as a source of data because of its broad nature and high standard of reliability. The Census Bureau uses sound methods of data collection and adheres to a strict standard of quality control. The variables that were obtained were the following: race, Hispanic or Latino origin, sex, age, marital status, educational attainment, school enrollment, employment status, hours worked per week in 1999, weeks worked in 1999, wage/salary income 1999, and place of work (state or foreign country). Further description of the Census variables can be found in Appendix A.

One occupation code was identified and selected for in order to isolate individuals whose primary work involved diesel mechanics. The occupation that was most representative of individuals working as diesel technicians was occupation number 721, "bus and truck mechanics and diesel engine specialists." There are other occupations in which diesel technicians work;

however, other types of skilled labor may be included in those occupations. It is fair to assume that the vast majority of those who identify themselves as working in occupation number 721 are indeed diesel technicians.

The sample was limited to individuals between the ages of 25 and 65 who were not enrolled in school as of February 1, 2000, and who were in the labor force but not employed by the military. Once these limitations were made, the sample included 12,775 people, 126 of whom were women.

In order to perform the appropriate statistical analysis, certain variables had to be created. Appendix B provides the name and description of these variables. Summary statistics for all variables by gender can be found in Appendix C. The summary statistics from the sample point to some interesting differences between female and male diesel technicians. The average hourly wage for men is $16.48 and for women is $14.59. Therefore, in this sample, women's average hourly earnings were 88.5 percent of men's, a considerably higher percentage than the 2004 national average of 80 percent. The demographic composition of males and females is also quite different. For example, while 47.6 percent of females in the sample are divorced, widowed, or separated, only 14.3 percent of men share this same marital status. The majority of men (74.3 percent) are married. Another difference worth noting is the racial diversity of females and males in this profession. Of males, 87.9 percent were white; of females, 77.0 percent were white. This research does not attempt to address these differences; however, because the demographic profiles are so different, it calls for future research to investigate why these differences exist. In order to conduct a comprehensive analysis of the wage differential by gender in diesel mechanics, it is important to acknowledge the differences between males and females revealed in the summary statistics.

The multiple regression analysis measured the effect of gender on the hourly wage of diesel technicians. The dependent variable was the natural logarithm of hourly wage. Hourly wage was calculated by dividing an individual's reported income from wages and/or salary by the product of the number of weeks worked in 1999 and the number of hours worked per week in 1999. The analysis included a carefully selected group of independent variables. A successful regression model is built on theory that guides the selection of variables to be included in the analysis (Rubinfeld, 2000, 186). Selection of the independent variables was based on a review of relevant literature and was constrained by the variables available in the Census data sample. A great deal of research has been conducted to determine which variables help to explain the variation in hourly wage among workers (Blau, 2000; Cohen, 1999; Fuchs, 1971; McCall, 2001; Rytina, 1982; U.S. General Accounting Office, 2003). Upon controlling for gendered differences in measured characteristics (e.g., marital status, education, experience), it may be argued that any additional unexplained difference is potentially the result of discrimination (Blau, 2000, 81). Proving that discrimination plays a role in determining hourly wage is quite difficult. For this reason, it is imperative for the model to be comprehensive and reliable.

The explanatory variables that were chosen to be included in the regression model are as follows: age, sex, educational attainment, Hispanic or Latino origin, marital status, race, potential work experience, and region of the country in which the respondent worked. To control for educational attainment, dummy variables were created that categorized workers into those that did not complete high school ("lowed"), those who completed high school ("hsed"), and those who received any amount of education after graduating from high school ("highed"). In the analysis, educational attainment below the level of high school graduate was the excluded category. The Census inquires as to whether the respondent is of Hispanic or Latino origin. This

is a separate question from the question that asks for the respondent's race. The variable was coded into two categories: Hispanic ("hispanic") and not Hispanic ("nohispanic"). Not Hispanic was the excluded category. Marital status was coded into three dummy variables: married ("married"); divorced, widowed, or separated ("divwidsep"); and never married ("nevmar"). Never married was excluded from the regression equation. The race variable was recoded into two dummy variables, white ("white") and nonwhite ("nonwhite"), of which nonwhite was excluded. A variable that predicts potential work experience was also included in the regression model. The variable was based on a formula used to predict potential work experience: the individual's age minus years of school completed minus six (Mincer, 1974). This provides a somewhat reliable measure of an individual's potential years of work experience. Finally, the state in which the respondent worked was coded into one of four dummy variables based on the region it was in, as defined by the U.S. Bureau of the Census: Northeast ("northeast"), Midwest ("midwest"), West ("west"), and South ("south"). South was excluded. The results of the regression analysis are provided in Table 1.

Table 1: Regression Model of Independent Variables and Hourly Wage

Adj. R- squared = .063

	Coefficient	Standard Error	P> |t|	95% Confidence Interval	
Age	.012	.004	0.001*	.005	.019
Sex	-.055	.042	0.194	-.138	.028
Hsed	.107	.014	0.000*	.080	.135
Highed	.166	.018	0.000*	.131	.201
Hispanic	-.064	.018	0.000*	-.098	-.029
Married	.126	.014	0.000*	.099	.153
Divwidsep	.037	.017	0.028**	.004	.070
White	-.003	.014	0.842	-.030	.024
Poexp	-.006	.004	0.080	-.013	.001
Northeast	.130	.012	0.000*	.105	.154
Midwest	.056	.011	0.000*	.035	.077
West	.140	.012	0.000*	.116	.164
Constant	2.040	.062	0.000*	1.918	2.162

N= 12,775   * = Statistically significant at the .01 level
                ** = Statistically significant at the .05 level

The coefficient for each variable represents the difference in the natural log of hourly wages between men and women, holding constant the effects of all the other variables. The positive sign on the coefficient indicates that an increase in hourly wage is correlated with that particular variable. For example, according to its coefficient, hourly wage increases with age ("age"). The negative sign on the coefficient indicates that a decrease in hourly wage is associated with that particular variable. For example, being of Hispanic or Latino origin ("hispanic") is correlated to a decrease in hourly wage. The size of the coefficient is also important. For example, even though having a high school degree ("hsed") and having greater than a high school degree ("highed") are both correlated to higher hourly earnings, having greater than a high school degree is correlated to a greater degree. The constant coefficient represents the value of the logged hourly wage when all independent variables are equal to zero. Therefore, the constant coefficient (2.040) represents the average logged hourly earnings for

never married, not Hispanic, non-white workers in the south with an educational attainment less than a high school degree.

According to the adjusted R-squared value, only 6.3 percent of the variation in hourly wage in the sample can be explained by the independent variables. This is quite low; it indicates that the wage of diesel technicians is correlated to some other factor or factors, such as productivity or experience within the field of diesel mechanics, which were not captured by the regression equation. Several combinations of variables were run separately but yielded little change to the adjusted R-squared value. Often, R-squared values are much lower in cross-sectional studies than in time-series studies; this suggests that the nature of the data is a limitation to the research (Rubinfeld, 2000, 216).

The column labeled "P>t" lists the two-tailed p-values, or the observed level of significance associated with each estimated regression coefficient. For this analysis, if the p-value was less than or equal to .05 it was considered to be statistically significant. In other words, if the p-value was less than or equal to .05, it could be reported with 95 percent confidence that the dependent and independent variables were correlated. If the p-value was greater than .05, the absence of correlation between the dependent and independent variable in question could not be ruled out. Of the independent variables, using a 95 percent confidence level, all were statistically significant with the exception of sex, race, and potential work experience. Therefore, based on the sample, gender is not a statistically significant predictor of the variance in hourly wage. With a p-value of .194, the null hypothesis could not be rejected therefore the possibility that men and women earn an equal wage as diesel technicians cannot be ruled out.

The creation of interaction to be included in a second regression model provided a more accurate estimation of the relationship between the independent and dependent variables. An

interaction term is simply a variable representing the product of two explanatory variables from

the multiple regression model. In this case, two different variables were interacted with sex. The

new variables were the interaction between having a high school degree and sex ("hsedxsex")

and the interaction between having greater than a high school degree and sex ("highedxsex").

The creation of these variables allowed for the effects of gender on hourly wage to change as the

level of educational attainment changes. According to secondary literature, the effect of gender

on hourly wage may be different for those at different levels of educational attainment. The

model will show whether the returns to higher education, in terms of hourly wage, are the same

for men and women. The extent to which hourly wage is affected by education for men and

women is detailed in Table 2.

Table 2: Regression Model of Independent Variables, Interaction Terms, and Hourly Wage
Adj. R- squared = .063

	Coefficient	Standard Error	P> |t|	95% Confidence Interval	
Age	.013	.004	0.001*	.005	.020
Sex	-.182	.106	0.086***	-.389	.023
Hsed	.106	.014	0.000*	.079	.134
Highed	.163	.018	0.000*	.128	.198
Hispanic	-.064	.018	0.000*	-.098	-.029
Married	.126	.014	0.000*	.099	.153
Divwidsep	.037	.017	0.027**	.004	.071
White	-.002	.014	0.857	-.029	.024
Poexp	-.006	.004	0.073***	-.013	.000
Northeast	.130	.012	0.000*	.105	.154
Midwest	.057	.011	0.000*	.036	.078
West	.140	.012	0.000*	.117	.164
hsedxsex	.085	.122	0.487	-.154	.325
Highedxsex	.233	.126	0.065***	-.014	.481
Constant	2.039	.062	0.000*	1.917	2.160

N= 12,775   * = Statistically significant at the .01 level
                ** = Statistically significant at the .05 level
                *** = Statistically significant at the .10 level

According to the regression output, at the .05 level, the interaction between sex and earning a high school degree is not a statistically significant predictor of the variance in hourly wage. In this sample, the returns to a high school degree, in terms of hourly wage, do not vary by gender.

The interaction between educational attainment above a high school degree and sex is not correlated to hourly wage at the .05 level. However, the p-value of .065 indicates that there is a marginally significant difference in hourly wage for men and women who have attained an education above a high school degree. Using a 90 percent confidence interval (p-value ≤.10), the effect of high educational attainment on hourly wage varies according to the gender of the worker. The positive coefficient on the variable "highedxsex" indicates that women who pursue degrees above the high school level can expect to get greater returns, in terms of hourly wage, than men. This is encouraging for women who seek higher education in that they can expect a smaller gender wage differential as their level of education increases.

Using a 90 percent confidence interval, almost every variable in the model is significant, with the exception of race and the interaction between sex and having a high school degree. It is important to note that in this model, there is a statistically significant correlation between the independent variable "sex" and the natural log of hourly wage at the .10 level. According to the regression coefficient, when all variables are held constant, women earn almost 18.2% less than men. This is a considerable difference and it mirrors that national average wage gap of approximately 80%. Despite these findings, for the purpose of this research, a 95 percent confidence level must be met in order to prove statistical significance. This being the case, the null hypothesis, which states that there is no gender wage differential in diesel mechanics, cannot be rejected.

The adjusted R-squared does not increase with the addition of the interaction terms. However, the purpose of including interaction terms in the regression model is not only to help explain the variance in the dependent variable but also to establish the existence of the relationships between the independent variables and dependent variables. Therefore, even though the adjusted R-squared value does not change, the inclusion of the interaction terms is still important.

Limitations

The limitations of this research must be explored as a means of critiquing the results and as a tool for designing future research in this area. Most importantly, this study is industry and occupation specific. As a result, broad assumptions regarding the experience of women in nontraditional occupations as a whole cannot be made. In addition, it cannot be presumed that the prospect of an equal wage will influence a woman to choose a particular career. Wage rate is likely to be only a contributing factor in determining what occupational path an individual will pursue. Just because wages are equal does not mean the job will appeal to women. For example, women are more likely to have shorter and more discontinuous work lives; therefore, they may especially avoid jobs requiring large investments in obtaining skills that are unique to one particular vocation (Blau 2000, 81).[10] If this is the case, diesel mechanics would be an example of a profession women may especially try to avoid.

The methods of the research were subject to several limitations. Though the U.S. Census is the most expansive instrument for data collection, the questions asked by the survey are limited and the data is cross-sectional, or collected at one point in time. The research was shaped by the data set in terms of the variables available for analysis. Certain elements that may have contributed to differences in hourly wage could not be captured by the Census data. Time series data could have perhaps provided variables more appropriate for the wage model.

Using the widely accepted confidence interval of 95 percent, the statistical analysis of the data sample reports that there is no correlation between gender and hourly wage, with the exception of the interaction between sex and high educational attainment and its affect on hourly

---

[10] By investing in a skill set that is relevant to a single occupation, the benefits of doing so will only be reaped if the individual remains in that sector. The ability of women to come in and out of the labor force is decreased if they have little flexibility in the type of jobs for which they are eligible. In addition, some employers may be reluctant to hire women and invest in their training for fear that they will not get a full return on their investment.

wage. It is important to note that the absence of correlation does not necessarily guarantee that a relationship does not exist. Lack of correlation could occur if there are insufficient data, the data are measured inaccurately, the data do not allow multiple causal relationships to be sorted out, or the model omits a variable or variables that are related to the variable of interest (Rubinfeld, 2000). These potential errors can negatively impact the results of a regression analysis. For example, the analysis may be limited by model specification error if additional variables not included in the model could explain some of the variation in hourly wage. In any case, the possible omission of necessary independent variables in the regression equation must be acknowledged.

Including a variable that indicated whether the individual was affiliated with a union may have had an interesting relationship with hourly wage. Many traditionally male dominated jobs happen to be protected by unions. This provides an additional form of security for women who enter these fields. Unions have the infrastructure and historical precedents to play a powerful role in integrating women into nontraditional occupations (Eisenberg, 1998). In addition, union membership is said to raise wages an estimated 10 to 20 percent (Council of Economic Advisers, 1998). Unions often set contracts with employers, therefore women and men with union affiliation may be more likely to have equal wages. If union members were excluded, it would have been possible to see if in the free market, employers unrestricted by union contracts paid women and men an equal wage. In controlling for union membership, evidence of a statistically significant difference in wage between male and female diesel technicians may have been present. A variable indicating union membership was not available in the Census data sample. This is just one example of perhaps a number of variables that may have helped to explain the variation in hourly wage in this profession.

In addition to error attributable to the omission of variables, error may result from the inclusion of variables that are not correlated with the dependent variable. Including irrelevant explanatory variables may reduce the precision of the regression output either by overestimating or underestimating the relationship between the explanatory variables and the dependent variable (Rubinfeld, 2000, 189).

Without an exact measure of work experience, a formula that predicts potential work experience was used. Though it is considered common practice to use this indirect measure of general experience, it is not a precise measure based on actual data. Because it assumes that workers have been employed continuously since leaving school, it tends to be a more accurate representation of a man's potential work experience (Rytina, 1982, 32) Women are more likely to have some gaps in their labor force history because of interruptions due to pregnancy and child rearing. The formula may overstate their actual years of experience, which in turn may understate the impact of work experience on earnings (Rytina, 1982, 32). Again, time series data may provide a more accurate measure of potential work experience. Taking these limitations into consideration, recommendations based on the findings of this analysis can be made.

Recommendations

Disseminating the information that women earn an equal wage in the traditionally male dominated occupation of diesel mechanics is crucial. Recruitment of women to the field of diesel mechanics can begin with letting women know that the data shows that there is not a statistically significant difference between the average male and female wage. Even though hourly wage is likely to be only one of several factors women consider when pursuing a career, it usually carries some weight in an individual's decision.

Entry into the field of diesel mechanics is practically guaranteed for those who complete an accredited program. The need for educated and trained employees has increased as the industry has undergone significant changes. Diesel technicians increasingly rely on technological advancements in performing their duties. As the trade grows increasingly more complex, completion of an accredited vocational program is becoming much more important. Because the need for trained diesel technicians is so great, women who seek formal training have the opportunity to fill this vacant niche in the industry.

The conversation about closing the gender wage gap belongs in the public arena. It is essential that women who have found success in nontraditional occupations be brought to the table. Historically, the government has been responsible for dismantling a great deal of discrimination in the workplace. Employers often need the threat of legal recourse to ensure equality in the workplace. Periodically, bills that call for strengthening the Equal Pay Act are introduced in Congress (Bayard, 1998). Such efforts should continue as long as there is evidence that wage discrimination in the workplace exists. Even though this analysis does not find evidence of wage discrimination between men and women in diesel mechanics, it is occupation specific and cannot be applied to any other occupations.

Under the Carl D. Perkins Act of 1998 (Perkins III), the federal law that funds career and technical education, states are allowed to spend a portion of funds on promoting nontraditional occupations (Programs and Practices that Work, 2005, 10). Programs seeking to increase female enrollment in nontraditional job training programs would be a possible use of the funds. When the free market is unable to eliminate discrimination, the law must intervene (Cohn, 2001, 170). Policies that make it easier for women to combine work and family will encourage women to remain in the labor market, especially with employers who have invested in their education and training (Blau, 2000, 97).

In 1996, the system of welfare in the U.S. changed dramatically with the enactment of Temporary Assistance to Needy Families (TANF). The goal of welfare reform was to provide tools for recipients to achieve self-sufficiency and economic security through work. As a result, employment among single mothers has increased (Meyer, 1999). Earning a living wage is key to making this reform work for women. Unfortunately, the kinds of jobs most women have found available after welfare are in "sales work, food services, and retail: notoriously unstable, low-paid occupations that offer few if any benefits or opportunities and in which high turnover is commonplace" (Hirschmann, 2001, 178). One study reported that in 1999, women who left welfare for work earned an average wage of $7.15 an hour (Martinson, 2003, 11). In comparison, in 2004, the average hourly wage of diesel technicians was $16.53.

For these women to be self-sufficient and economically stable, they must have access to higher paying jobs that offer stability and room for advancement. The potential exists for a powerful connection to be made between TANF's welfare to work programs and women's entry into nontraditional occupations such as diesel mechanics. Women moving from welfare to work are looking for job security and a steady wage, characteristics of the skilled-trade professions

(Borrego, 2002, 30). In 2001, just 1.5 percent of federal TANF funds were spent on education and training and only 5 percent of TANF recipients participated in such activities (Martinson 2003, 28). Much more can be done in providing women the education and training they need to secure a position in the labor market equivalent to that available to a man. Providing incentives to states that encourage the pursuit of nontraditional occupations for women is one possible way to forge the connection between a supply of labor and a demand for labor.

Further research that explores wage differentials in other male dominated occupations would allow for conclusions to be drawn regarding the relationship between women and wages in nontraditional occupations. Even though gaining entry into nontraditional jobs may be difficult for women, perhaps once they are trained and educated, they can expect a wage equal to that of their male counterparts. This cannot necessarily be said for other occupations that may be more accessible to women. This could be a great incentive for women to pursue nontraditional occupations. A broader study of women's wages in nontraditional occupations is necessary to shed more light on this issue.

Conclusion

Though women continue to confront discrimination in the labor market, the extent to which it exists seems to be declining.   Women have made great strides over the past few decades in closing the gender wage gap. As women's education and experience increase, it is much more realistic to expect that women will have an equal opportunity to compete with their male counterparts for jobs. This research has shown that in the field of diesel mechanics, the wage differential between women and men is not statistically significant. Based on relevant theory and evidence from secondary literature, it was originally thought that a gender wage gap would likely exist. However, for the sample, this was not the case. As discussed previously, several limitations exist that prevent broad assumptions from being drawn from the conclusions presented in the analysis. What can be derived from this research is that the evidence provided does support the notion that diesel mechanics is a potential profession for women in which they can expect to earn a wage comparable to that earned by men.

References

Alfeld, Corinne and James Stone. 2004. "Keeping Kids in School: The Power of CTE."
  Techniques 79 (4).

Association for Career and Technical Education. Retrieved November 22, 2004, from
  http://www.acteonline.org.

Bayard, Kimberly, Judith Hellerstein, David Neumark, and Kenneth Troske. 1998, April. "New
  Evidence on Sex Segregation and Sex Differences in Wages from Matched Employee-
  Employer Data." Paper prepared for the International Symposium on Linked Employer-
  Employee Data. Washington, D.C.: U.S. Bureau of the Census.

Bendel, John. 2000. "Crisis in the Shop." *Heavy Duty Trucking,* April.

Blau, Francine D. and Lawrence M. Kahn. 2000. "Gender Differences in Pay." *Journal of
  Economic Perspectives*, 4(14): 75-99.

Blau, Francine D. and Lawrence M. Kahn. 1997. "Swimming Upstream: Trends in the Gender
  Wage Differential in the 1980s." *Journal of Labor Economics,* 15(1): 1-42.
.
Borrego, Anne Marie. 2002. "For Profit Colleges Adapt to a Skilled-Trades Renaissance."
  Chronicle of Higher Education, 48(32): 29-32.

Chandrasekaran, Rajiv. 1997. "A Seller's Market for Tech Jobs." *Washington Post*: A01.

Cohen, Philip N. 1999. "Racial-Ethnic Gender Differences in Returns to Cohabitation and
  Marriage: Evidence from the Current Population Survey." Population Division Working
  Paper No. 35. Washington D.C.: U.S. Bureau of the Census, Population Division.

Cohn, Samuel. 2000. *Race and Gender Discrimination at Work*. Boulder, Colorado:
  Westview Press.

The Council of Economic Advisors. 1998. "Explaining Trends in the Gender Wage Gap."
  Retrieved August 25, 2005, from
  http://clinton4.nara.gov/WH/EOP/CEA/html/gendergap.html.

Deierlein, Bob. 1999. "Technicians: Where are they?" *Fleet Equipment,* May: 48-51.

DeNavas-Walt, Carmen, Bernadette D. Proctor, and Cheryl Hill Lee. 2005. *Income, Poverty, and
  Health Insurance Coverage in the United States: 2004.* U.S. Census Bureau,
  Current Population Reports, P60-229. Washington, DC: U.S. Government Printing
  Office.

Eisenberg, Susan. 1998. *We'll Call You If We Need You: Experiences of Women Working
  Construction*. Ithaca, New York: Cornell University Press.

Fuchs, Victor. 1971. "Differences in Hourly Earnings Between Men and Women." *Monthly Labor Review,* 94(5): 9-15.

Goldfisher, Alastair. 1998. "Mechanics work overtime to fix problems with VTA fleet." *Silicon Valley/San Jose Business Journal,* November 20.

Hattiangadi, Anita U. 1998. "'Where's My 26 Cents?' Choices Explain Gender Wage Gap." Economic Policy Foundation. Retrieved August 25, 2005 from http://www.epf.org/pubs/newsletters/1998/ff4%2D6.asp

Heavy Duty Trucking. 1998. "Where are the Mechanics: Raiding your competition's pool of technicians may not be the best course of action." June. Retrieved November 16, 2004 from www.heavydutytrucking.com/1998/06/054a9806.asp.

Hirschmann, Nancy and Ulrike Liebert. 2001. *Women and Welfare.* New Jersey: Rutgers University Press.

Hite, Alice Karen. 1995. "Selling Voc Ed." *Vocational Education Journal,* 69(2): 32-34.

Kane, Thomas J. and Cecilia Elena Rouse. 1995. "Labor Market Returns to Two- and Four- Year College." *The American Economic Review,* 85(3): 600-614.

Kelley, Sean. 2001. "Who Will Fix Your Trucks." *Commercial Carrier Journal,* October: 26-30.

Lawrenz, Frances and Richard Zinser. 2004. "New Roles to Meet Industry Needs: A Look at the Advanced Technological Education Program." *Journal of Vocational Education Research,* 29(2).

Leavitt, Wendy. 1999. "Shopping Around: Do you really want to stay in the maintenance business?" *Fleet Owner,* March: 68-74.

Levesque, Karen et al. 2000. *Vocational Education in the United States: Toward the Year 2000.* U.S. Department of Education: National Center for Education Statistics. Washington, D.C.: NCES 2000–029.

Light, Paul. 2000. "The New Public Service." *Government Executive,* January.

Martinson, Karin & Strawn, Julie. 2003. "Built to Last: Why Skills Matter for Long-Run Success in Welfare Reform." Center for Law and Social Policy. Retrieved October 20, 2005, from http://www.clasp.org/publications/BTL_report.pdf

McCall, Leslie. 2001. *Complex Inequality: Gender, Class, and Race in the New Economy.* New York, NY: Routledge.

Meyer, Bruce D. and Dan T. Rosenbaum. 1999. "Welfare, the Earned Income Tax Credit, and the Labor Supply of Single Mothers." NBER Working Paper No. 7363.

Mincer, Jacob. 1974. *Schooling, Experience, and Earnings*. New York: Columbia University Press.

National Association of State Directors of Career Technical Education Consortium. 2003. "Indicators of Success: CTE and Research." Retrieved November 21, 2004 from http://www.careertech.org.

National Women's Law Center. 2002. "Title IX and Equal Opportunity in Vocational and Technical Education: A Promise still Owed to the Nation's Young Women." Retrieved September 10, 2005, from http://www.nwlc.org/pdf/career%20ed%20report%20for%20june%206%20press%20event3.pdf

Programs and Practices that Work: Preparing Students for Non-Traditional Careers Project. 2005. "Forging New Pathways: Promising Practices for Recruiting and Retaining Students in Career and Technical Educational Programs that are Nontraditional for their Gender." Retrieved November 10, 2005 from http://www.nwlc.org/pdf/Report2005_PPTW_Final.pdf

Quinn, Brenda. 2004, May 4. "Testimony of Brenda Quinn, President and CEO, Intelitek. House Committee on Education and the Workforce Education Reform Subcommittee." Retrieved November 16, 2004, from http://www.skillsusa.org/PDF/quinn.pdf.

Refrigerated Transporter. 2003, April. "Recruiting and retaining diesel mechanics."

Rubinfeld, Daniel. 2000. "Reference Guide on Multiple Regression." In *Reference Manual on Scientific Evidence*. 2nd ed. Washington, D.C.: Federal Judicial Center, 179-227.

Ruhland, Sheila K. 2003. "Evaluating Tech Prep Education Programs: Implications for Reporting Program and Student Outcomes." *Journal of Vocational Education Research* 28(1).

Rust, Pamela. 2003. "Transportation 'cluster' takes shape." *Business North*, February 7, 2003. Retrieved on November 16, 2004, from www.businessnorth.com/viewarticle.asp?articleid=618

Ryder, Andrew. 1998. "Staffing the Shop." *Heavy Duty Trucking*, August.

Rytina, Nancy. 1982. "Tenure as a factor in the male-female earnings gap." *Monthly Labor Review*, 105(4): 32-34.

Shumer, Robert. 2001. "A New, Old Vision of Learning, Working, and Living: Vocational Education in the 21st Century." *Journal of Vocational Education Research,* 26(3).

Siegel, Shepherd. 2004. "Career and Technical Education is Real. And Real Important."

Techniques, 79(1).

Skipper, G.C. 1996. "An Industry Threat Grows Worse: Will a Diesel sideline shortage sideline your truck?" *Overdrive,* 36(10): 36-42.

U.S. Census Bureau, Population Division, Education & Social Stratification Branch. 2002. "Table 9. Earnings in 2001 by Educational Attainment for People 18 Years Old and Over, by Age, Sex, Race, And Hispanic Origin." Washington, DC. Retrieved November 10, 2005, from http://www.census.gov/population/socdemo/education/ppl-169/tab09.txt.

U.S. Department of Labor, Bureau of Labor Statistics. "Quick Stats 2004." Retrieved August 25, 2005, from http://www.dol.gov/wb/stats/main.htm.

U.S. Department of Labor, Bureau of Labor Statistics. "Nontraditional Occupations for Women in 2004." Current Population Survey. Unpublished data. Retrieved August 25, 2005, from http://www.dol.gov/wb/factsheets/nontra2004.htm.

U.S. Department of Labor, Bureau of Labor Statistics. 2005. "College Enrollment and Work Activity of 2004 High School Graduates." Retrieved August 25, 2005, from http://www.bls.gov/news.release/hsgec.nr0.htm.

U.S. Department of Labor, Bureau of Labor Statistics. 2005. *Occupational Outlook Handbook, 2004-05 Edition*. Retrieved October 18, 2005, from http://www.bls.gov/oco/home.htm.

U.S. Department of Labor, Bureau of Labor Statistics. 2005. "Diesel Service Technicians and Mechanics." In *Occupational Outlook Handbook, 2004-05 Edition*, Retrieved October 18, 2005, from http://www.bls.gov/oco/ocos182.htm.

U.S. General Accounting Office. 2003. "Women's Earnings: Work Patterns Partially Explain Difference Between Men's and Women's Earnings." Retrieved August 25, 2005, from http://www.gao.gov/new.items/d0435.pdf.

Williams, Christine. 1989. *Gender Differences at Work: Women and Men in Nontraditional Occupations*. Berkeley, California: University of California Press.

Wootton, Barbara.1997. "Gender differences in occupational employment." *Monthly Labor Review*, 120(4): 15-24.

Appendix A: Census Variables

Variable Name	Description
AGE	Age
EDUC	Educational Attainment
ESR	Employment Status Recode
HISPAN	Hispanic or Latino Origin
HOURS	Hours per week in 1999
INCWS	Wage/Salary Income 1999
MARSTAT	Marital Status
OCCCEN5	Occupation (Census) for 5%
POWST5	Place of Work State or Foreign Country Code for 5% file
RACE1	Race Recode 1
SEX	Sex
WEEKS	Weeks Worked in 1999
ENROLL	School Enrollment; Attended since February 1, 2000
PWEIGHT	Person Weight

Appendix B: Recoded Census Variables

Variable Name	Description	Definition
married	Married	If MARSTAT is equal to 1
divwidsep	Divorced, widowed, or separated	If MARSTAT is equal to 2, 3, or 4
nevmar	Never married	If MARSTAT is equal to 5
lowed	Educational attainment is anything less than high school graduate	If EDUC is equal to or less than 8 (12th grade, no diploma)
hsed	Educational attainment is high school graduate	If EDUC is equal to 9 (High school graduate)
highed	Educational attainment is anything more than a high school graduate	If EDUC is equal to or greater than 10 (Some college, but less than 1 year)
hispanic	Of Hispanic or Latino origin	If HISPAN is equal to 2 through 24
nonhispanic	Not of Hispanic or Latino origin	If HISPAN is equal to 1
white	White alone	If RACE1 is equal to 1
nonwhite	Any race other than white alone	If RACE1 is equal to 2-9
black	Black or African American alone	If RACE1 is equal to 2
otherrace	Race other than white alone or black or African American alone	If RACE is equal to 3-9
hrlywage	Hourly wage	INCWS/(WEEKS*HOURS)
HrlyWage	Natural log (ln) of hourly wage	ln (hrlywage)
yrseduc	Years of education	EDUC variable converted into years of education
poexp	Potential labor force experience	AGE-yrseduc-6
south	Geographical region of the United States.	If POWST5 FIPS codes are equal to 10, 11, 12, 13, 24, 37, 45, 51, 54, 1, 21, 28, 47, 5, 22, 40, or 48.
northeast	Geographical region of the United States.	If POWST5 FIPS codes are equal to 9, 23, 25, 33, 44, 50, 34, 36, or 42.
midwest	Geographical region of the United States.	If POWST5 FIPS codes are equal to 17, 18, 26, 39, 55, 19, 20, 27, 29, 31, 38, or 46.
west	Geographical region of the United States.	If POWST5 FIPS codes are equal to 4, 8, 16, 30, 32, 35, 49, 56, 2, 6, 15, 41, or 53.
hsedxsex	Interaction between educational attainment (high school degree) and sex	hsed*sex
highedxsex	Interaction between educational attainment (greater than a high school degree) and sex	highed*sex

Appendix C: Summary Statistics

Variable	Male		Female	
	Mean	**Std. Dev.**	**Mean**	**Std. Dev.**
Age	41.90	9.66	39.65	9.14
Hours	44.46	8.57	42.83	9.13
Weeks	50.04	6.55	50.59	4.11
Income Work/Salary	$34,745.02	17788	$30,912.70	15255.69
Hourly Wage	$16.48	16.22	$14.59	7.58
(ln) Hourly Wage	2.67	.486	2.564	.490
Low Ed.	20.10%	.401	15.87%	.367
High School Ed.	48.90%	.500	46.83%	.501
High Ed.	31.01%	.463	37.30%	.486
Years of Ed.	11.89	1.761	12.07	1.174
Hispanic	7.34%	.261	11.11%	.316
Not Hispanic	92.66%	.261	88.89%	.316
Married	74.33%	.437	31.75%	.467
Divorced, Widowed, Separated	14.31%	.350	47.62%	.501
Never Married	11.36%	.317	20.63%	.406
White	87.94%	.326	76.98%	.423
Black	5.32%	.225	14.29%	.351
Other Race	6.74%	.251	8.73%	.283
Years of Potential Work Experience	24.01	10.00	21.58	9.37
Northeast	17.61%	.381	19.05%	.394
Midwest	29.12%	.454	19.84%	.400
South	33.84%	.473	42.86%	.497
West	19.42%	.396	18.25%	.388

⬜ = Variable was a statistically significant predictor of the variance in hourly wage (at the .05 level), according to the multiple regression analysis.