University Center for Social and Urban Research

GENDER WAGE DISPARITY IN THE PITTSBURGH REGION: ANALYZING CAUSES AND DIFFERENCES IN THE GENDER WAGE GAP

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Executive Summary

This report analyzes the gender wage gap—the difference in earnings between men and women—in the Pittsburgh region. Women have raised their participation in Pittsburgh's job market since the 1980s, matching national averages today, with women making up nearly half the region's labor force. Nevertheless, the region's historically large wage differences between men and women persist to this day. This report examines the reasons for this and compares Pittsburgh to other metropolitan regions. Highlights of the report include:

- ***The gender wage gap in the Pittsburgh region exceeds the national average:*** The gender wage gap for full time, year-round female workers in the Pittsburgh region is larger than for women nationally. This difference holds across most industries and occupations. A notable exception is for women in farming, who, in 2000, earned substantially more than women farmers nationally and slightly more than men in farming regionally.
- ***Women in Pittsburgh comprise nearly half (48 percent) of the region's workforce:*** As late as 1980, women were severely underrepresented in the Pittsburgh region's labor force, making up less than 40 percent of all employed workers. Women in the Pittsburgh region traditionally had much lower labor force participation rates than women in general in the U.S. and even lower than women in most metropolitan areas. This changed with the collapse of the region's heavy-industrial economy. The proportion of women in the region's workforce has steadily increased in the past 20 years and since 2000 has nearly matched the proportion of male workers, but…
- ***Women live under heavy industry's legacy:*** Although manufacturing is no longer dominant in Pittsburgh, the former male-dominated heavy-industry structure still affects women's earnings today. We call this the "legacy effect."
- ***Pittsburgh lags in proportion and wage equality of women in management jobs:*** Pittsburgh women in commercial management earned just 58.3 percent of what local men in private-sector management positions earned and only 89.5 percent of the national median earnings for women in management. For women in management positions in the not-for-profit sector in Pittsburgh, their earnings ratio to men was only slightly better at 64.3 percent. Men in both for- and not-for-profit management positions in Pittsburgh, however, earned more than men nationally with 109.1 and 103.7 percent of average earnings, respectively. In the public sector, the earnings gap between male and female managers was narrower than the commercial and nonprofit sectors in both Pittsburgh and the nation.
- ***Higher education degree on average does not narrow the gender wage gap in Pittsburgh:*** Women in Pittsburgh with less than a high school education earned 75 percent of their male contemporaries in 2000. Women with a graduate degree earned just 71 percent of the pay men with a similar education earned.
- ***Pittsburgh is among the most gender segregated metropolitan job markets:*** Women in Pittsburgh are more concentrated in select industries and occupations than women nationally, on average. Among the country's 100 largest metropolitan areas,

Pittsburgh ranks 71st for distribution of men and women by occupation and 80th by industry. San Francisco is the region with the most equal distribution of men and women along both industry and occupation measures.

- ***A faster growing Pittsburgh would make wages more equal:*** The gender wage gap is significantly related to employment and population growth. Faster growing regions across the United States register lower gender wage gaps than slower growing places such as Pittsburgh. The wage gap also tends to be smaller in the government sector, thus capital cities show more equitable wages for women and employ more highly educated women than non-capital cities such as Pittsburgh.

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Introduction

Both nationally and in the Pittsburgh region, one of the most profound changes of the 20th century was the vast expansion in the number of women as wage earners in the economy. Between 1970 and 1990, the female labor force participation rate in the U.S. increased from 43.3 to 59.9 percent. In 2004, approximately 59 percent of all women age 16 and over were in the labor force, compared to 73 percent of all men (U.S. Bureau of Labor Statistics 2005).

Female labor force participation rates (LFPRs) also rose in Pittsburgh, but the rate of increase lagged national trends. The dramatic increase in female labor force participation in the U.S. would be delayed by the industrial structure of the Pittsburgh region. For much of the 20th century, Pittsburgh region women, in general, would be far less likely to be wage earners compared to women across the country.

Today, however, that picture has changed. Female labor force participation rates across race and age cohorts in Pittsburgh mirror U.S. averages.

Nonetheless, despite increases in the number of female workers and female labor force participation rates over the past five decades, earnings of women workers have been slow to converge to male earnings.

First, nationally, what is known as the gender wage gap persists, though it has narrowed somewhat over the past decades. In 2004 in the U.S., full-time, full-year female workers earned 76.5 percent of men's earnings, an improvement from a wage gap of approximately 60 percent that persisted through the early 1980s (Institute for Women's Policy Research 2005).

Second, women in the workforce in Pittsburgh earn less than men not only because of underlying national trends, but also local factors, including industrial legacy. The purpose of this report is to analyze and understand this gap in earnings between women and men in the Pittsburgh region. The specific reason for studying the gender wage gap in Pittsburgh is that it appears to be larger than many other metropolitan regions.

A 2004 report by the University Center for Social and Urban Research, *Women's Benchmarks Reports* (Bangs et al 2004, 32-33), found that the Pittsburgh region scored relatively low for women's earnings, women's income, and female-male earnings disparities compared to the largest fifty regions in the county in 2000. The report found that women workers in the region ranked seventh lowest in earnings. Full-time, full-year female workers in the Pittsburgh region had the eighth lowest median earnings among the 50 largest regions. The gender wage gap, comparing the earnings of full-time female workers to full-time male workers' earnings, stood at 70 percent, 7th lowest in the nation.

There are many reasons for the gender wage gap. These include a number of social, economic and demographic factors that contribute to differences in earnings, such as education, years in the labor force, occupation, industry, marital status, hours and weeks of work, race and ethnicity, as well as discrimination in labor markets.

Specifically, in this study, we compare the Pittsburgh region to the U.S. and the 100 largest metropolitan regions in the nation to determine what creates a relatively larger gender wage gap in Pittsburgh. This report examines both historical and current data compiled from various sources to analyze and compare the gender wage gap.

The report begins with the historical trends affecting women in the Pittsburgh region's labor force. The history of heavy manufacturing plays an integral role in the evolution of women's roles in the region. The evolution of the Pittsburgh region's economy away from its traditional base has affected nearly all aspects of the regional labor force, with pronounced impacts on working women that continue today, what we call the *legacy effect*. Following that discussion is a description of current wage differentials in the regional economy with breakdowns across industry, occupation and educational level. This type of breakdown is a necessary starting point to narrow which part of the labor force is contributing to the overall gender wage gap that is consistently observed. Regional labor markets are made up of very different groups of workers. These groups of workers compete among themselves for available jobs but in many ways do not compete against each other because of the different education and skill requirements for different jobs. A summary of competing theories on the cases of gender wage disparity is presented next. Using these materials, the analysis then develops a model of causal factors that differentiate the degree of gender wage disparity across regions. Results and implications from the study conclude the report.

Women in the Pittsburgh Labor Force

> *(Pittsburgh) will, however, slowly decline unless new industries employing women and those engaged in the production of consumer goods are attracted to the area.*
>
> - Econometric Institute (1947)

The position of women in the workplace in Pittsburgh has represented a distinct difference from women nationally beginning a century ago. At the beginning of the 20th century, women generally had low participation rates in the American labor force. In 1900, however, women in the Pittsburgh region exhibited even lower rates of female labor force participation than the nation (Shergold 1982). This marks the beginning of understanding women's work and wages in Pittsburgh.

National trends in female labor force participation were exacerbated in Pittsburgh by the employment patterns of the industries that dominated the Pittsburgh economy, including coal mining and metals manufacturing. Historian Peter Shergold (1982) noted that married women in the comparable industrial region of Birmingham, England, were four times more likely to work outside the home as wives in Pittsburgh. Even though during the first decades of the 20th century increasing numbers of women entered the workplace in the U.S., lower rates continued for women in Pittsburgh. The differences only narrowed with the Great Depression, which depressed female labor force participation nationally.

World War II brought unprecedented changes to the role of women in the labor force. Faced with severe labor shortages across the country and magnified labor demand in all industrial regions, women were drawn into the labor force in unprecedented levels. Between 1940 and 1944 over 5 million American women entered the American workforce (Shank 1988). The demand for workers would not only attract young unmarried women into the workforce but older and married women who had the least representation in the workforce previously. For Pittsburgh and the nation, however, the influx of women into the labor would prove to be a temporary phenomenon. "Rosie the Riveter" would soon be displaced by men returning from military service to work at war's end. The nation's labor force participation rate for women stood at 32 percent just after World War II.

While men returning from wartime service would displace women in the workforce across the country, the effect was more pronounced in the Pittsburgh region, which retained an industrial structure concentrated in a few male-dominated industries. Wartime exigencies that had inhibited any trend at industrial diversification left the regional economy even more concentrated in heavy industry after the war than before. Vast wartime expansion also exacerbated many of the problems that had existed before the war. As Pittsburgh faced its post-war future, the many challenges were obvious. Severe environmental problems, infrastructure deficits, and housing deficits were to be addressed by a series of initiatives that would later be labeled the Pittsburgh Renaissance.

Also clearly identified at the time was the impact of women, or more precisely the lack of women, in the local labor force. One of the initial acts of the Allegheny Conference on Community Development, which was created to address Pittsburgh's post-war revitalization, was to sponsor a comprehensive study of the region's economy. The report compiled by the Econometric Institute (1947) in New York identified a series of structural problems in the local economy that would need to be addressed. The lack of diversification in Pittsburgh economy was a primary obstacle to future economic growth. The local industries of the day were clearly not industries that employed women, nor could be expected to employ significantly more women in the near future.

The national trend of increasing female labor force participation was already apparent and the local industrial structure was particularly unsuited to take advantage of this new pool of labor. The prognostication at the time was that Pittsburgh's economic growth would depend on diversification into industries that took advantage of the growing market for consumer goods and the growing labor supply of wage earning women. Failure to do both would limit future economic growth in the region.

Even though its industrial concentration was identified as an impediment to future growth, the region's economy would remain concentrated in heavy industries in the decades after World War II. This lack of industrial diversification in the regional economy meant that, for the most part, women would remain under-represented in the region's labor force for decades after World War II. This was in spite of two major changes occurring. First, around the nation, the most significant social change was the dramatic increase in female labor force participation. Second, female educational attainment rose, as women were matriculating into programs of higher education in record numbers. Beginning in the 1950s and expanding in the 1960s, women enrolled in ever-higher levels of education and new female graduates looked for jobs and opportunities with their new degrees in hand. How many highly educated women left the region during this time, or failed to return after attending college elsewhere, because the lack of professional opportunities in Pittsburgh will probably never be known precisely.

In the late 1950s and early 1960's, the Pittsburgh Regional Planning Association and the Ford Foundation revisited the state of the Pittsburgh's region economy with a multi-year *Economic Study of the Pittsburgh Region* (Pittsburgh Regional Planning Association 1963). Their detailed findings were clear and consistent with what had been concluded earlier by the Econometric Institute. The region's economy had not diversified significantly and remained inhospitable to female workers, creating what they called "a striking peculiarity of the Pittsburgh labor market" (Pittsburgh Regional Planning Association 1963, p. 34). From 1900 to 1950, the authors showed that female labor force participation rates in Pittsburgh were lower than the nation and lower than large metropolitan areas in general. For instance, in 1950, the labor force participation rate for women was 32.1 percent in U.S. metro areas, 29.3 percent in the nation as a whole, and 24.4 percent in the Pittsburgh region.

Female labor force participation at the time remained well below national levels with particular groups in the population severely underrepresented in the labor force. Lower rates than the nation persisted in Pittsburgh for both white and nonwhite females and married women (see Table 1). Married white females, for example, had a labor force participation rate of 19.5

percent in Pittsburgh in 1960, compared to 29.7 percent in the nation. Labor force participation rates of married, nonwhite females, likewise, were lower in Pittsburgh than the nation, 26.0 percent and 40.7 percent, respectively.

Table 1. Labor Force Participation Rates, U.S. and Pittsburgh Labor Market Area, 1960

	U.S.	Pittsburgh	Difference: Pittsburgh – U.S.
All persons age 14+	55.3	51.9	-3.4
Male	77.4	77.3	-0.1
White	78.0	77.7	-0.3
Nonwhite	72.1	70.9	-1.2
Female	34.5	28.4	-6.1
White	33.6	28.2	-5.4
Married, husband present	29.7	19.5	-10.2
Other	40.5	43.6	+3.1
Nonwhite	41.8	31.9	-9.9
Married, husband present	40.7	26.0	-14.7
Other	42.8	38.3	-4.5

Source: Pittsburgh Regional Planning Association, 1963, p. 34.

The authors attributed the major reason for lower rates in Pittsburgh to the region's economic structure. There are several parts to this. First, Pittsburgh industries employed relatively low numbers of women. At the time of the report, in the U.S., women made up 80 percent of workers in apparel and textiles industries and 33 percent of light electrical equipment, electronics and scientific industries. These were not, however, the main industrial sectors in Pittsburgh. In Pittsburgh's main manufacturing industries – steel, primary metals, glass, machinery, and heavy metal fabrication -- only between 6 and 17 percent of all workers were women (Pittsburgh Regional Planning Association 1963, p. 36).

With an apparent labor "surplus," why didn't new industries enter the regional economy attracted by this potential workforce, as happened in other parts of the state, the authors of the *Economic Study* (1963, p. 37) asked? Contributing to the low rate of female labor force participation across the region was the nature of industrial work dominant in the region. Most industrial employment was shift work, which typically required a worker to rotate through the various shifts available in a manufacturing plant. Such dynamic work scheduling made it difficult for there to be a second wage earner in a household, especially a household with children. This work scheduling plus the relatively high wages in unionized sectors meant that there was a diminished need for multiple wage earners in households with a manufacturing worker. The report further speculated that the region's scattered residential settlements, coupled with a lack of rapid transit, may have made a less flexible female labor force and thus making Pittsburgh less attractive for industries that employed relatively high proportions of women. Finally, as discussed above, low female labor

force participation rates had persisted in the region for half a century or more, perhaps continued by cultural preferences.

Cumulatively, we call this the legacy effect of Pittsburgh's industrial history and structure. As we proceed in this study, we attempt to measure and quantify the legacy effect as it affects current gender wage structure.

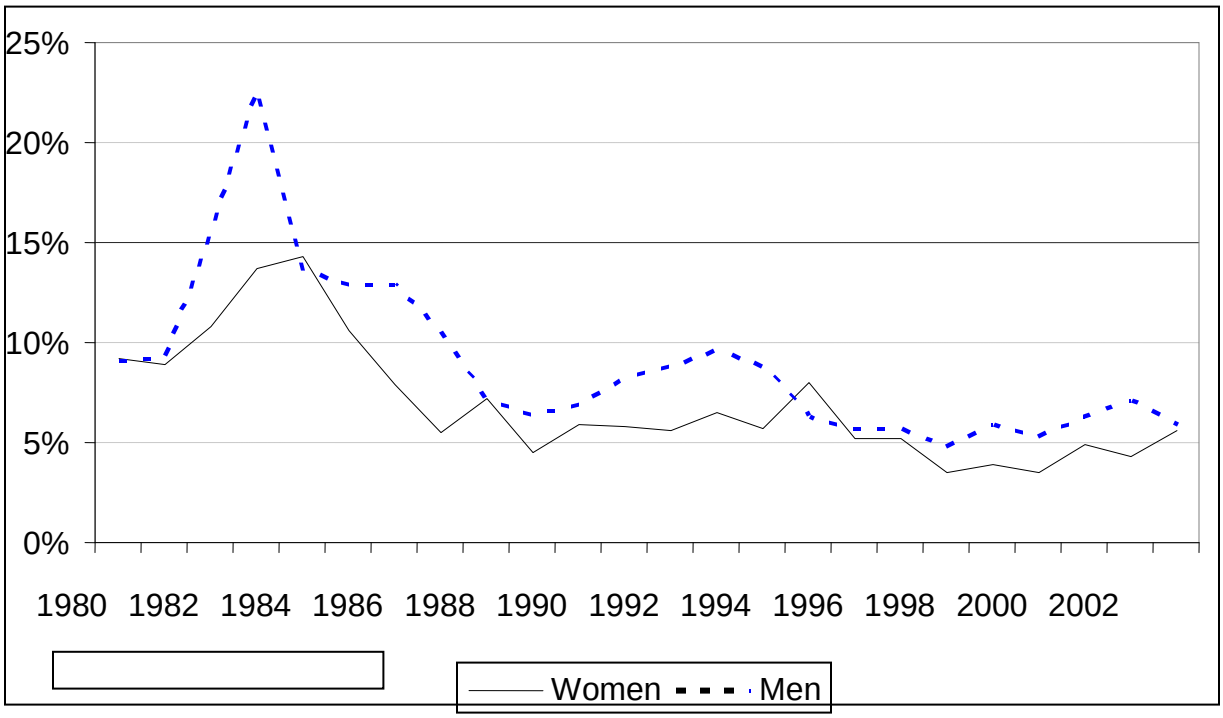
As the region entered its structural crisis in the late 1970s, it contained some of the same core deficiencies identified more than three decades earlier by the Econometric Institute and documented in depth by the Pittsburgh Regional Planning Association in the early 1960s. The Economic Study projected that the Pittsburgh region would continue to lose market share in heavy manufacturing industries. Changes in the structure of the steel industry, and growing demand in areas far from Pittsburgh would continue to pressure the local industrial output and lead to employment decline across many industries in the decades that would follow. These predictions would play out almost exactly as forecasted.

The forecasted decline of heavy industry in the region accelerated in the early 1980s as the combination of shifting production technology and global competition eroded Pittsburgh's competitive advantage in steel production. The large-scale job destruction that resulted would force the evolution of the regional economy and, with it, bring a fundamental shift in the place of working women in Pittsburgh.

By the early 1980s, the expansion of women in the workforce had been a national trend for many decades, but it was only then that the trend accelerated in Pittsburgh. Pittsburgh's primary job losses in the early to mid 1980s were in the heavy manufacturing industries dominated by male employees. Many of the newly unemployed in the region were the sole wage earners for their households. Between 1980 and 1986, the Pittsburgh region lost 115,500 manufacturing jobs and nearly half of these were in the steel industry. Despite this job loss, total employment dropped only 7 percent over these years, buoyed by job growth in other sectors (Deitrick 1999). Nonetheless, these manufacturing jobs were some of the highest paying jobs in the region and likely were comprised of a disproportionate number of primary wage earners in local households. Despite common belief at the time that the downturn represented only another cycle in what had always been volatile manufacturing employment, the job loss in the 1980s represented permanent structural change for the Pittsburgh regional economy and the role of women in its workforce.

While the economic collapse in the early 1980s would affect all sectors of the economy and raise unemployment rates for both men and women, the impact on men was much more pronounced. The unemployment rate for men peaked at over 22 percent in 1983 compared to just under 14 percent for women in the Pittsburgh region that year (see Figure 1). The persistence of male unemployment would continue even as employment in the region began to increase across a range of non-manufacturing industries. One result was that unemployment in the Pittsburgh region remained dominated by men. In 1987, an estimated 70 percent of those defined as unemployed were men. Economic necessity during this period forced many women to enter the workforce as either second or primary wage earners.

Figure 1. Pittsburgh Region Unemployment by Gender, 1980-2003



Source: Compiled from Current Population Survey Merged Outgoing Rotation Groups

Labor Force Participation Rates

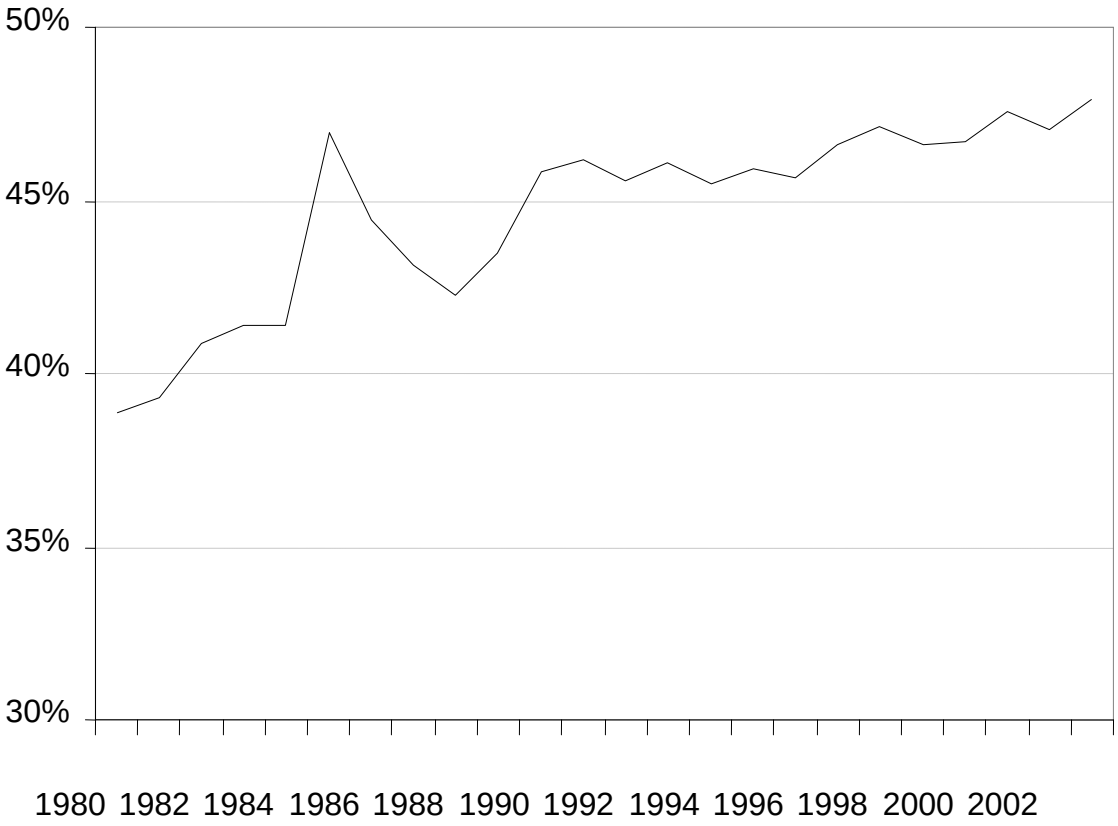
Over the 20th century, Pittsburgh exhibited labor force participation rates (LFPRs) for women well below national norms. The restructuring of the regional economy brought women into the labor force fairly rapidly. Though the increase in female labor force participation rates lagged the nation for most of the century, the pace accelerated in the 1980s. Between 1985 and 2005 the gap between local and national female labor force participation rates steadily narrowed. Yet it would be the 21st century before the female labor force participation for women in the Pittsburgh region would reach levels comparable to the nation as a whole.

By 2001-2003, female labor force participation in the Pittsburgh region was statistically indistinguishable from national levels. The growth in health care, education and financial service industries had more than made up for the loss of jobs the region experienced in the 1980s. Manufacturing has not faded completely from the local economy but its role as the sole 'export' industry bringing income into the region was a far cry from what it was decades ago.

The expansion of female labor force in the Pittsburgh region occurred as the local economy diversified away from heavy manufacturing toward new growth areas in services. Significant employment gains for women were concentrated in the service sector, health care, educational services and financial service industries. Taken together, the diversification of the local industry mix and growing female labor force participation has produced near parity in the representation of women in the Pittsburgh region workforce. As late as 1980, women were estimated to

comprise less than 40 percent of the region's employed workforce (see Figure 2). By 2003, women made up over 48 percent of the region's labor force.

Figure 2. Women in Pittsburgh Region Labor Force, Percent of Total, 1980-2003

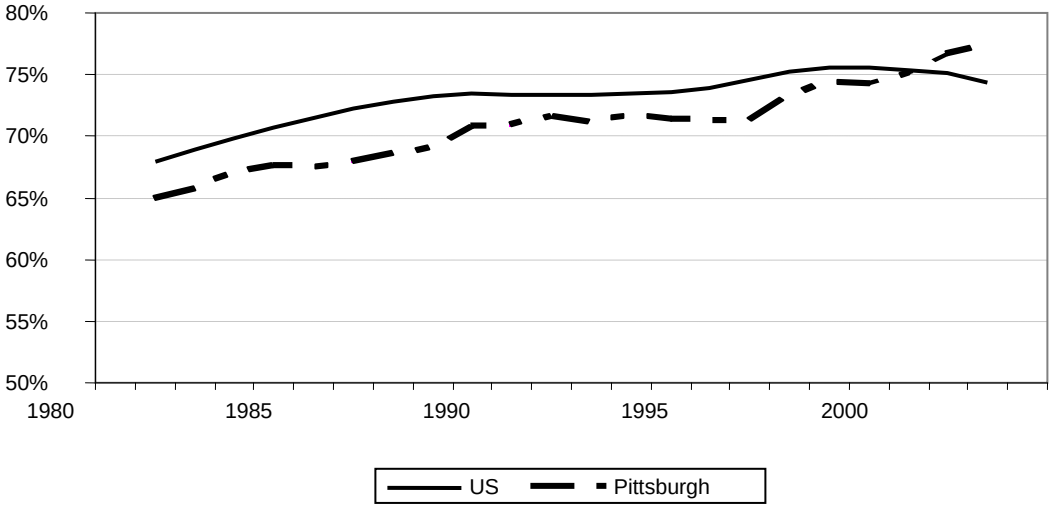


Source: Compiled from Current Population Survey(CPS) Merged Outgoing Rotation Groups

Women are singularly responsible for the region regaining its employment and labor force levels above their peaks prior to the massive job losses of the 1980s. Between 1980 and 1998 the total number of men employed in the Pittsburgh region remained equal, yet over that same period the number of women employed has grown by an estimated 42 percent. In fact total employment and total labor force would reach their all time peaks in the Pittsburgh region in the late 1990s. This expansion in the local labor force, despite the large structural job loss of the 1980s was only possible because of the dramatic increase in female labor force participation.

The source of change in overall labor force participation rates for females in the region can be understood better by analyzing labor force participation rates by age cohorts. Young females in Pittsburgh, aged 21 – 34, began with the highest labor force participation rates in 1980 and the narrowest gap between them and U.S. rates (see Figure 3). Consequently, the increase in working females in this age cohort meant that by 2001, labor force participation rates of women in Pittsburgh aged 21 to 34 exceeded the U.S. rate.

Figure 3. Female Labor Force Participation, Aged 21-34 - Pittsburgh vs. U.S., 1980-2002 (three year moving average)

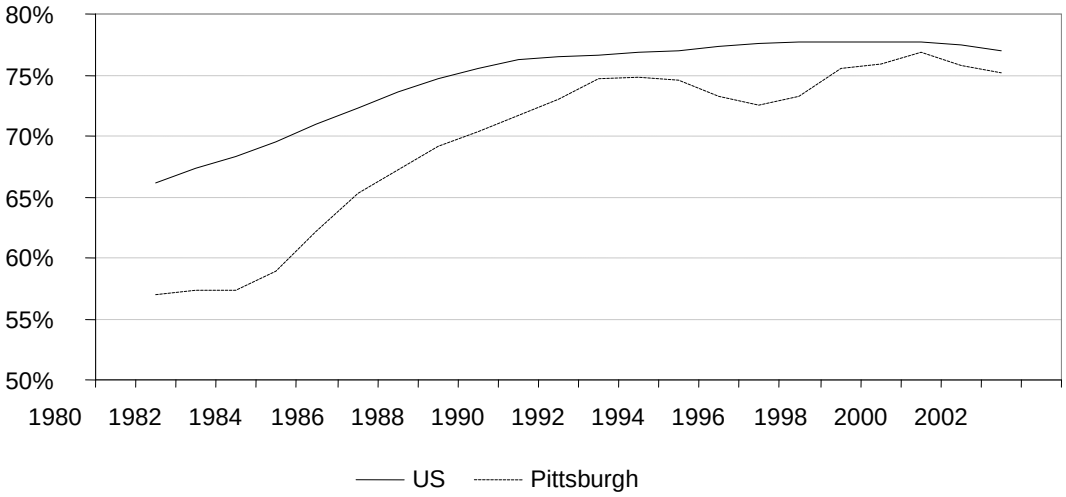


Source: Compiled from Current Population Survey Merged Outgoing Rotation Groups

Perhaps the biggest change in the population of working women in the Pittsburgh region is among women in the 35-49 year old cohort (see Figure 4). From 1981 to 2000, labor force participation rates for this cohort increased from 57.5 percent to 71.6 percent. The largest jump occurred between 1984 and 1985, when the participation rate of these women increased from 57.4 percent to 64.6 percent, as wives and female family members entered the labor force in response to massive layoffs of mainly men in heavy manufacturing industries in the region.

The difference between the U.S. and Pittsburgh rates also narrowed for this age cohort. In 1983, U.S. female LFPR exceeded those in Pittsburgh by 13.4 points. In 2001, Pittsburgh's female LFPRs for the 35-54 age cohort exceeded the U.S. rate for the first time. Though female labor force participation rates for women in Pittsburgh aged 35-54 dropped from a high of 78.8 percent in 2001 to 71.6 percent in 2003, presumably this is a short term change and rates will remain comparable to the nation in the future.

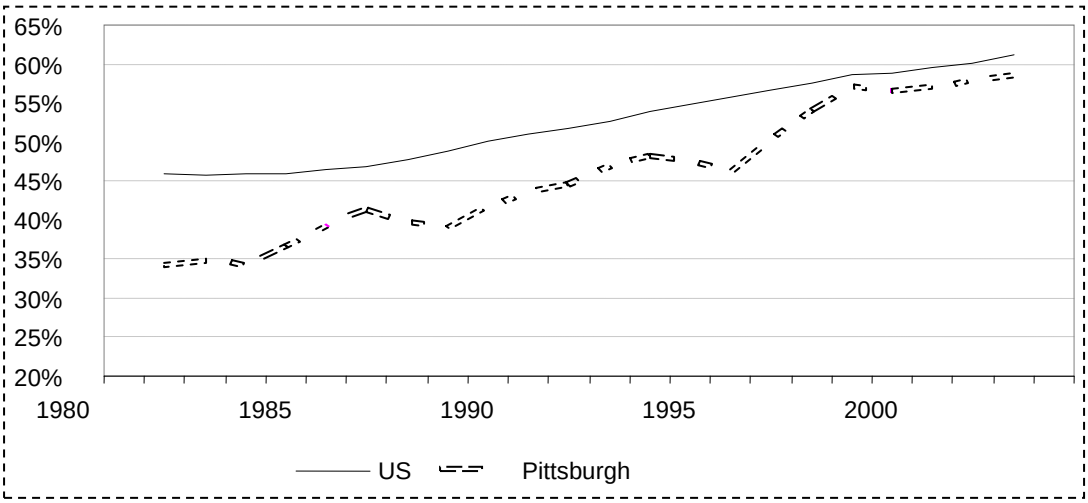
Figure 4. Female Labor Force Participation, Aged 35-49 - Pittsburgh vs. U.S., 1980-2002 (three year moving average)



Source: Compiled from Current Population Survey Merged Outgoing Rotation Groups

Finally, for women aged 55 to 64, labor force participation rates have also risen since the mid 1980s, but haven't reached the U.S. averages yet (Figure 5). Historically, this cohort of women has participated in the workforce at lower rates in Pittsburgh than in the U.S. This is borne out by the uneven rates of change in the LFPR for older working females in Pittsburgh. Though labor force participation rates shot up dramatically during the economic crisis of the mid 1980s – a jump from 31.4 percent in 1984 to 42.0 percent just one year later in 1985 – the increases were probably shorter term changes in response to male unemployment rather than structural shifts. Labor force participation rates for women aged 55-64 did not register significant increases again until the late 1990s. LFPRs for Pittsburgh women in this cohort were 11.2 points lower than the U.S. rate in 1995. Between 1996 and 1997, LFPRs rose from 48.0 percent to 58.5 percent. They remained just under 60 percent through 2003 and remained consistently just a few points below the U.S. average.

Figure 5. Female Labor Force Participation, Aged 50-64 - Pittsburgh vs. U.S., 1980-2002 (three year moving average)



Source: Compiled from Current Population Survey Merged Outgoing Rotation Groups

Unionization Rates

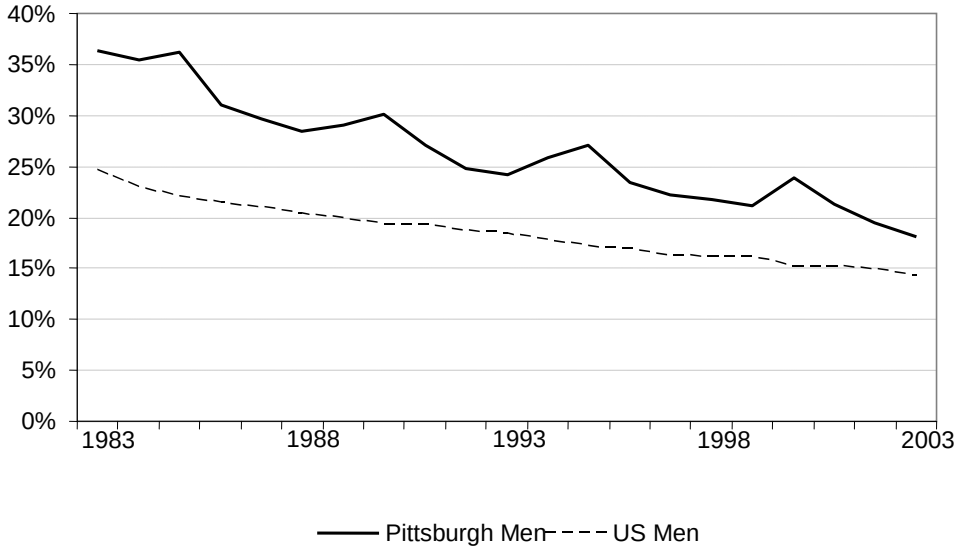
The presence or absence of unions affects workers' wages and also male and female wage inequality. A general conclusion from early research was that unions exacted an equalizing effect on wage disparities. Thus the decline in union membership over the past three decades has been seen by some to be a contributing force to greater wage disparities between men and women. Recent research, however, suggests this relationship may not hold (Card 2001).

The effects of unions can be broken down in a number of ways. First, unionization trends show declines in union membership. Overall, union membership has steadily declined among men in the U.S. and declined even more dramatically among men in Pittsburgh (see Figure 6).

Relative to the nation, unionization of female workers in the region has not been disproportionately higher than unionization rates in the nation, as has the unionization rate for male workers. Unionization among female workers tended to be slightly higher than national rates over the 1980s and 1990s, but in the most recent years, the local unionization of female workers is nearly equal to national levels (see Figure 7).

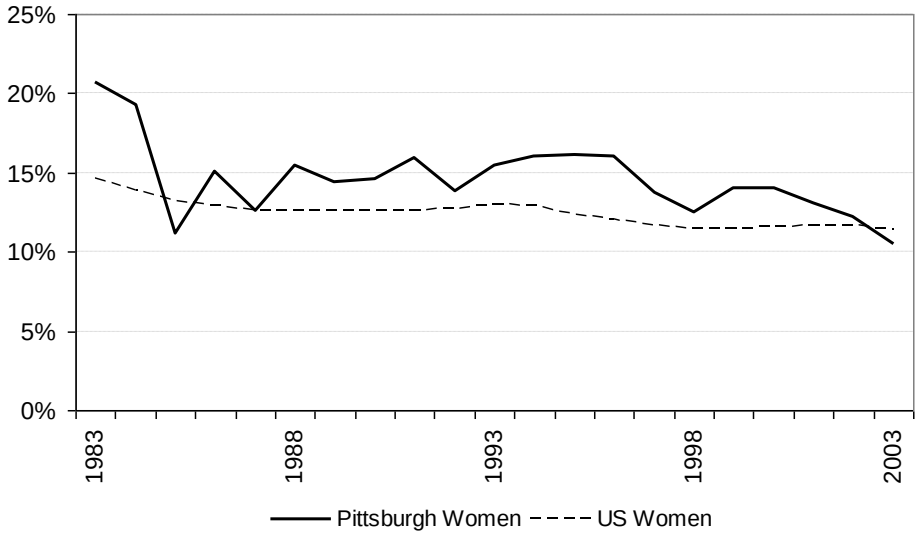
Unionization patterns differ markedly between the public and private sectors. The decline in unionization is especially evident in the private sector. In the public sector, however, unionization rates rose over these same decades. In 2000, private sector unionization rates for women and men in the Pittsburgh MSA were 8.4 percent and 19.6 percent, respectively. Public sector rates were 52.5 percent and 57.9 percent, respectively.

Figure 6. Male Unionization Trends -- Pittsburgh vs. U.S., 1983-2003



Source: Compiled from Current Population Survey Merged Outgoing Rotation Group

Figure 7. Female Unionization Trends -- Pittsburgh vs. U.S., 1983-2003



Source: Compiled from Current Population Survey Merged Outgoing Rotation Group

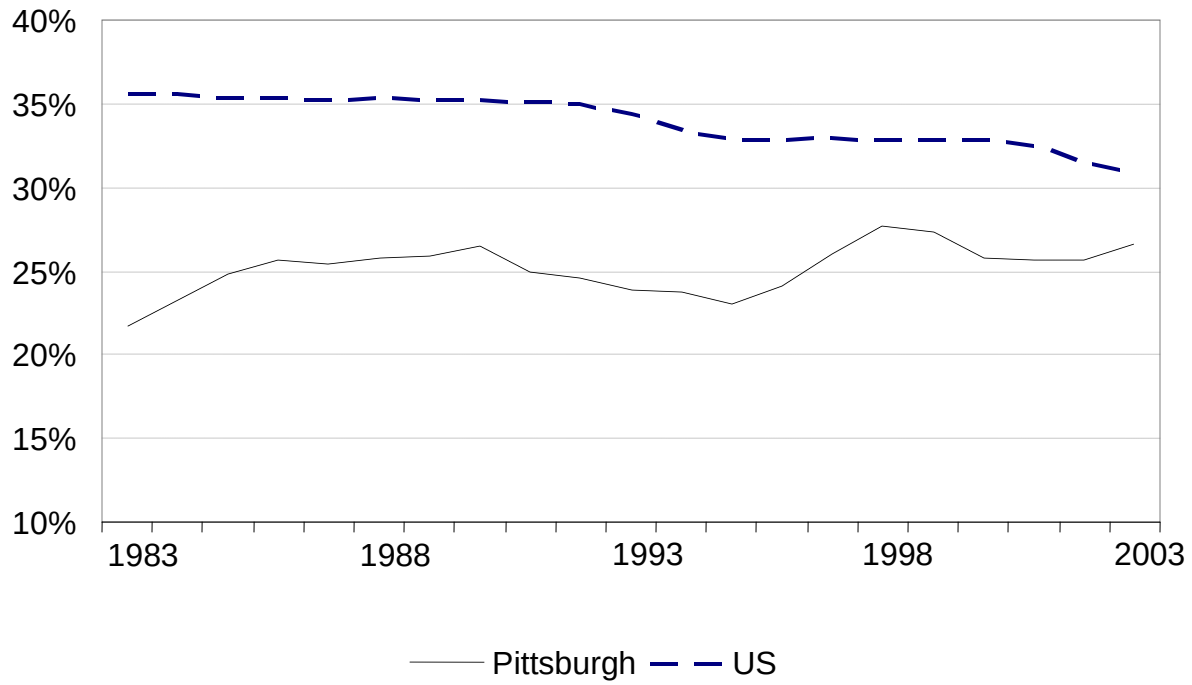
Employment Structure

Pittsburgh's heavy manufacturing industries, as discussed above, employed mainly male workers, unlike light manufacturing industries, such as textiles and apparel. By the 1970s, however, women and minorities were increasing their employment in traditional industries in Pittsburgh. This was especially true in the steel industry, which was ordered by the courts to end

patterns of labor discrimination within the industry (Fonow 2003). In 1974, nine steel companies signed a consent decree that required representation of women and minorities in craft jobs in the industry, set hiring goals for women and minorities, and restructured the seniority system (Deaux and Ullman 1983; Fonow 2003). An analysis of the industry conducted several years later concluded that the consent decree was at least partially responsible for a sharp increase in the number of women in blue collar, steel industry jobs from the mid to late 1970s (Deaux and Ullman 1983, p. 104).

By the mid 1980s, women had climbed to over one-quarter of the Pittsburgh region's manufacturing workers. Despite this significant change, women were still much less represented in manufacturing compared to the U.S. (see Figure 8). We'll return to this important difference later in the report (see penultimate section).

Figure 8. Female Manufacturing Industry Employment as Percent of Total Employment -- Pittsburgh vs. U.S. 1983-2003



Source: Compiled from Current Population Survey Merged Outgoing Rotation Group

Thus as the Pittsburgh region's labor market continues to evolve into the 21st century, it faces a bigger puzzle. The historical differences between job opportunities available to women and men in the Pittsburgh labor market have clearly diminished as the local economy has diversified. Yet the wage gap between men and women persists. Addressing gender wage inequity through most of Pittsburgh's history was simple to understand yet difficult to mitigate. Even if it was

universally understood that the concentration of manufacturing industries in the region worked against women in the labor force, the inertia of hiring practices in such industries made change difficult or impossible.

Current gender inequities in the Pittsburgh region do not have the simple explanations that were valid in the past. We investigate why gender inequities still persist in the Pittsburgh region investigate and why the gender wage gap for Pittsburgh continues to compare unfavorably to national trends.

Explanations of Gender Wage Disparities

Gender wage disparity is not a condition unique to the Pittsburgh region. One of the most universal and persistent economic conditions has been the disparity in wages earned by men versus women. In the United States the gender gap has been declining but remains a chronic condition in the labor force. By one measure which includes both full-time and part-time workers, women were still earning on average 63 percent of men's earnings in 2004.[1]

Many factors have contributed to the narrowing of the gender wage gap nationally. One of the most important factors has been the narrowing difference in the characteristics of workers. As women have attained similar educational characteristics they have entered into a far wider range of industries and occupations. Women earned 57.2 percent of bachelor's degrees in 2000. By 2000, women also earned a majority of the associate and master's degrees in the U.S. (Postsecondary Education Opportunity 2002). Over time, women have also been able to gain greater labor market experience, which has allowed them to progress up the income ladder in their respective careers. Although substantial, shifts in employment across industries have had relatively little effect on the gender pay gap. Increases in the returns to skill and increasing wage differences across occupations and industries -- particularly in the 1980s -- dampened women's relative wage gains, since women were disproportionately represented among the less-skilled and in lower-paying occupations.

Below we briefly review the theories used to explain the gender wage gap.

Human Capital – Education and Experience

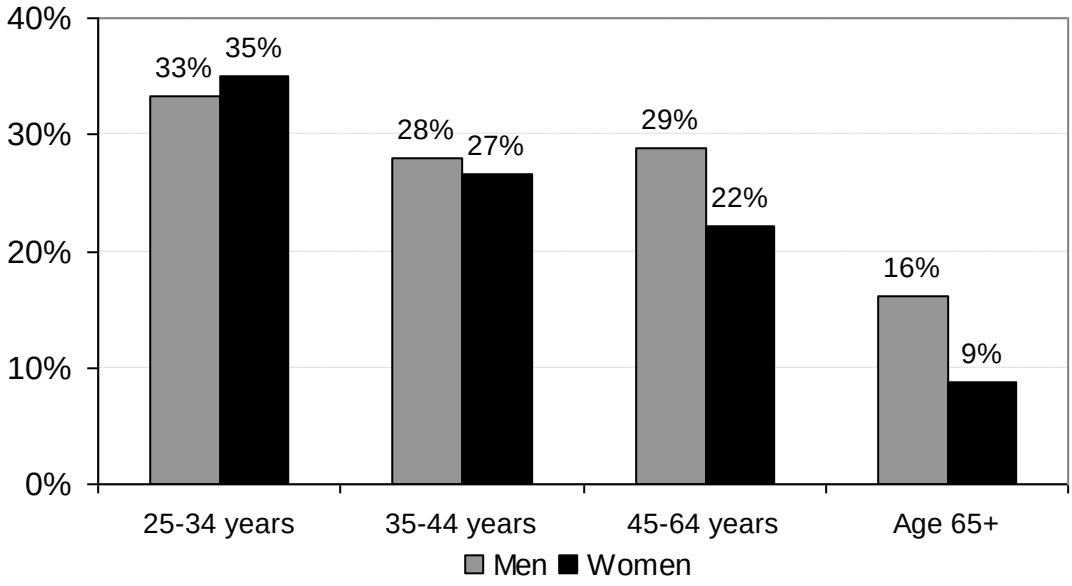
Human capital, which includes education and labor market experience, is often viewed as the primary determinant of differences in wages in the labor market. Additional education and the accumulation of skills make individual workers more valuable to employers which should be reflected in the market wages they earn in a competitive labor market.

One of the main reasons given for lower earnings for women historically has been the differences in levels of educational attainment and cumulative labor market experience (Becker 1973).

The educational disparity between men and women has narrowed considerably in recent decades. For instance, in 1970, 7.3 percent of the female population in Pittsburgh, age 25 and over, had completed four or more years of college, barely half the 14.4 percent for men. In 2000, 21.4 percent of the female population in Pittsburgh had a bachelors degree or higher, compared to 26.7 percent for men. The convergence of educational patterns between genders is even more pronounced at younger age cohorts (see Figure 9). Looking just at the population age 25-34, the proportion of women in the Pittsburgh region who have a bachelors degree or higher (35.0 percent) exceeds the proportion for men (33.2 percent).

[1] Data from the Quarterly Workforce Indicators (QWI), Longitudinal Employer-Household Dynamics (LEHD) program, US Census Bureau. Annual Data for 2004. Overall men earn an average of $3865 per month while women earn an average of $2,451 per month. These measures do not take into account differences in hours worked.

Figure 9. Percentage of Population with Bachelors Degree or Higher by Age Groups and Gender: Pittsburgh MSA - 2000



Source: Census 2000

The difference in labor market experience between men and women has been narrowing at the same time, but not to the degree that educational gaps have diminished. Differences in labor market experience between men and women remain far greater than differences in their educational attainment. Though experience is one of the more difficult worker characteristics to measure precisely, even the narrow gap between men and women in terms of labor force participation would cause women to lag in the accumulation of labor market experience over a career.

Family Status and Children

Differences in labor market experience derive mainly from the gender roles within the family. The result is that the relationship between family status and pay is different for men and women (Ferber and Green 2003). While married men, most of whom have children, typically earn more in the labor market than unmarried men, for women the relationship is reversed. The presence of children, especially young children, in a household correlates closely with lower labor force participation rates for women. Even controlling for job experience, Budig and England (2001) found that there is a 5 percent wage penalty per child for mothers.

For women who re-enter the labor market after being out of the labor market, the effects on their long term wages can persist through their careers. Again, years out of the labor market directly affect the accumulation of labor market experience which is then reflected in skills and market value in the labor market. Recent research by Rose and Hartmann (2004, p. 12) concluded that "women have more years out of the labor market and more years of low earnings with the result that their long-term aggregate earnings are much lower than men's." The authors found that over

the 15 year period from 1983-1998, the average women in the U.S. workforce earned just 38 percent of male earnings (Rose and Hartmann 2004).

Occupation

Women do not compete directly with men for many jobs because of the occupational segregation that exists in the labor force. Historically men and women tended to work in different occupations, which resulted in detrimental impacts for women's wages. Both men and women in female dominated occupations earn substantially less than workers in occupations with lower female composition. Bergmann's (1971; 1974) work on "occupational crowding" suggested that discrimination against women in certain jobs "crowded" them into fewer occupations. The rising supply of women meant that wages were reduced in these jobs. Other work suggested that wages declined as the proportion of women in an occupation rose (Killingsworth 1990; Macpherson and Hirsch 1995).

Men's and women's occupational status has changed over time. Women have increasingly moved into traditionally male occupations. Occupational segregation by gender began to decline noticeably in the 1970s as both women and men entered non-traditional occupations in greater numbers. Movement of women into traditionally male occupations was the predominate cause of the decrease in occupational segregation in the 1970s and 1980s. In the 1980s, growth of overall employment in more integrated occupations was somewhat more important than it had been in the 1970s. By one measure the decline in occupational segregation alone in the 1980s would have reduced the gender gap by about three percentage points.(Council of Economic Advisors, 1998). Nonetheless, some jobs remain predominantly gendered, e.g., women are still much more likely to work in service and clerical jobs than men, while men remain more likely to be in blue collar (craft, operator, and labor) jobs.

Although occupational desegregation has continued in the 1990s, the rate of desegregation through the mid-1990s appears to have been somewhat slower than the rate during the 1970s and 1980s. Recent research concludes that the share of women in an occupation remains one of the strongest contributing factors to the gender wage gap (Boraas and Rodgers 2003).

Unions

Union membership is estimated to boost wages of union members relative to non-union members. Men have traditionally been more likely to be union members than women, which helped increase the gender pay gap.

The decline over the last 25 years in the fraction of the workforce that is unionized has raised women's relative pay as fewer men receive union wages. In addition, the share of unionized workers who are female has increased as unions have declined less (or even grown) in certain public sector and service-related occupations that have a greater share of female workers. These female union members have benefited from higher union wages. But, overall, the decline of unions has had a relatively small role in the declining gender pay gap; by itself, it would have caused the gender pay gap to decline by about one percentage point over the 1980s.

Labor union members earn more than non-members. But in addition to the individual effect on wages, unions also lobby for higher minimum wages, worker protection laws, and more generous social services (Asher et al. 2001; Hansen 2006).

Industry Structure

The effect of industry structure and economic restructuring on the gender wage gap shows important effects. Economic restructuring has led to increased wage inequality among certain workers, particularly blue collar men and minorities, but its effects on the gender wage gap are mixed. On the one hand, the loss of male-dominated manufacturing, often unionized, jobs meant a reduction in male wages, thus a reduction in the gender wage gap, or what has been called *reduced male opportunity* (Lorence 1991, 776; McCall 1998). On the other hand, economic restructuring has led to growth in low-wage, often casual employment. Many of these jobs are in personal and retail services and employ large numbers of women, especially immigrant workers (McCall 1998). The argument here is that restructuring has led to greater gender inequality, particularly for non-college-educated women.

We do know that differences in wages across industries are substantial and persistent for similar types of workers. For example, wages for similar workers are 37 percent higher than average in the petroleum industry but about 17 percent lower than average in retail trade. Fields and Wolff (1995) found that the overall industry effect accounted for about one-third of the gender wage gap, using 1988 data for the nation. Blau and Kahn (1996; 1997; 2001) likewise found the industry effects on the gender wage gap to be significant.

Sociological Factors

There are a number of sociological and cultural factors that may affect the gender wage gap. Linda Babcock (Babcock and Laschever 2003) of Carnegie Mellon University found that women may do worse than men in earnings because of differences in wage negotiations, beginning with their first position. This then affects their earnings profile into the future. Her research shows that significantly fewer female graduate students asked for more than initially offered when negotiating job offers compared to men. Such results have been supported by experimental research by Lise Vesterlund (Niederle and Vesterlund, 2007) at the University of Pittsburgh who, along with others, has shown that women show a lower propensity to engage in competition than men. If individual difference in the propensity to negotiate over wages affects lifetime earnings and such differences are systematic between genders then they may explain large differences in female earnings.

Regional Differences

Significantly less research looks at why gender disparities differ across regions either in the U.S. or other advanced industrial countries.

Aspects of the local or regional labor market can also influence both wage levels and the gender gap in wages. States and localities also differ in population, living costs, and prevailing or minimum-wage laws, and these factors also affect compensation. McCall (1998) found that labor markets with high rates of unemployment

Nonprofit Employment

The role of nonprofit organizations on female earnings and the gender wage gap is a relatively newer arena of analysis, compared to the more traditional human capital approaches. For that reason, the literature is not conclusive on the role that nonprofits play in these wage differences. What emerges is an arena that suggests a variety of institutional and industry effects on nonprofit wages, reflecting the great diversity that encompasses organizations in the nonprofit sector (Leete 2001).

Generally, nonprofits tend to pay less than the for-profit sector, reflecting a concentration of nonprofits in relatively low-paid industries (Ruhm and Borkoski 2000). However, nonprofit workers may receive similar pay as their counterparts in the for-profit sector when they are equivalent employees in similar positions (Ruhm and Borkoski 2003). In some areas, nonprofit workers earn more than their for-profit equivalents (Ruhm and Borkoski 2000; c.f. Leete 2001).

Other research, however, has found lower earnings for nonprofit workers. Hansen, Huggins, and Ban (2003) found that the gender gap in non-profit salaries in the Pittsburgh region was larger than that of for-profits. Female non-profit employees in Pittsburgh also earned less than women working for nonprofits outside this region. And the gap persisted even after controlling for age, years of experience, or level of education. The gap was evident for employees of general non-profits as well as for those working in education or medicine. Ban and Towers (2003) also found a significant gender gap in wages for non-profit executives in the Pittsburgh region as well as employees. Other work also shows that even controlling for individual characteristics, such as education and work experience, and institutional characteristics, such as size of organization and affiliation, female executives in nonprofit organizations receive significantly lower compensation than males (Gray and Benson 2000).

Since 66 percent of nonprofit employees are women, the impact of nonprofits on female earnings is important. There are two ways to group studies (Leete 2001). The first considers wage differences arising from the different properties in the goods produced by nonprofit and for-profit entities. In general, much of the work on nonprofit pay considers the application of donative-labor important – that is, nonprofits produce different goods and services than for-profit companies. Workers will accept lower pay in the nonprofit's production, in exchange for the nonpecuniary benefits the nonprofit yields. The second explanation considers nonprofits and for profit firms producing the same product, and focuses on conditions in the organizations, such as size, and the regulatory and tax environments. This is used to explain higher wages in some nonprofit areas compared to for profit counterparts (Leete 2001).

On the other hand, Leete (2001) found no single economy-wide nonprofit wage effect. She did find significant differences between nonprofit and for profit wages within particular industries and occupations. However, she did not examine gender differences in the sector.

Nonprofit employment's share of total employment in the Pittsburgh region is 11.3 percent in 2000. By gender, 7.1 percent of men were workers in the nonprofit sector in 2000, while 16 percent of women were in the nonprofit sector. This is significantly higher than nonprofit's share of total Pennsylvania's employment, 11.5 percent, or the U.S. at 6.9 percent. And this is significantly higher than the 10 percent of female workers nationally who were employed in the nonprofit sector among our top 100 metropolitan areas in 2000.

Not surprisingly, nonprofit's share of total employment in the City of Pittsburgh is much higher, at 24.4 percent (Briem 2006). With its hospitals and educational facilities, nonprofits now are often the largest employers in a region. Since the Pittsburgh region has a relatively large nonprofit sector, this is an important area to consider in analyzing the region's gender wage gap.

tended to lower wages for less educated women, while labor markets with high technology concentrations paid a premium to both women and men, though the male premium was higher.

Race and Immigration

Race and immigration are two other factors that have been examined to understand the wage gap. Race affects the gender wage gap in multiple ways. McCall (1998) found that women's relative wages are lower in MSAs with larger African-American populations.

Surprisingly, women do relatively better in regions with high proportions of Hispanics and/or immigrants, even though Hispanic women earn significantly lower wages than Caucasian or African-American women. One reason may be that immigrants tend to concentrate in larger urban areas, which pay higher wages on average. Another is that since Hispanic men also tend to earn low wages, the wage ratio will be higher in regions with high proportions of Hispanics. Third, states or MSAs with higher rates of immigration tend to have growing economies and faster rates of job creation. High rates of job growth tend to be related to lower gender wage disparities.

State Legislative Environment

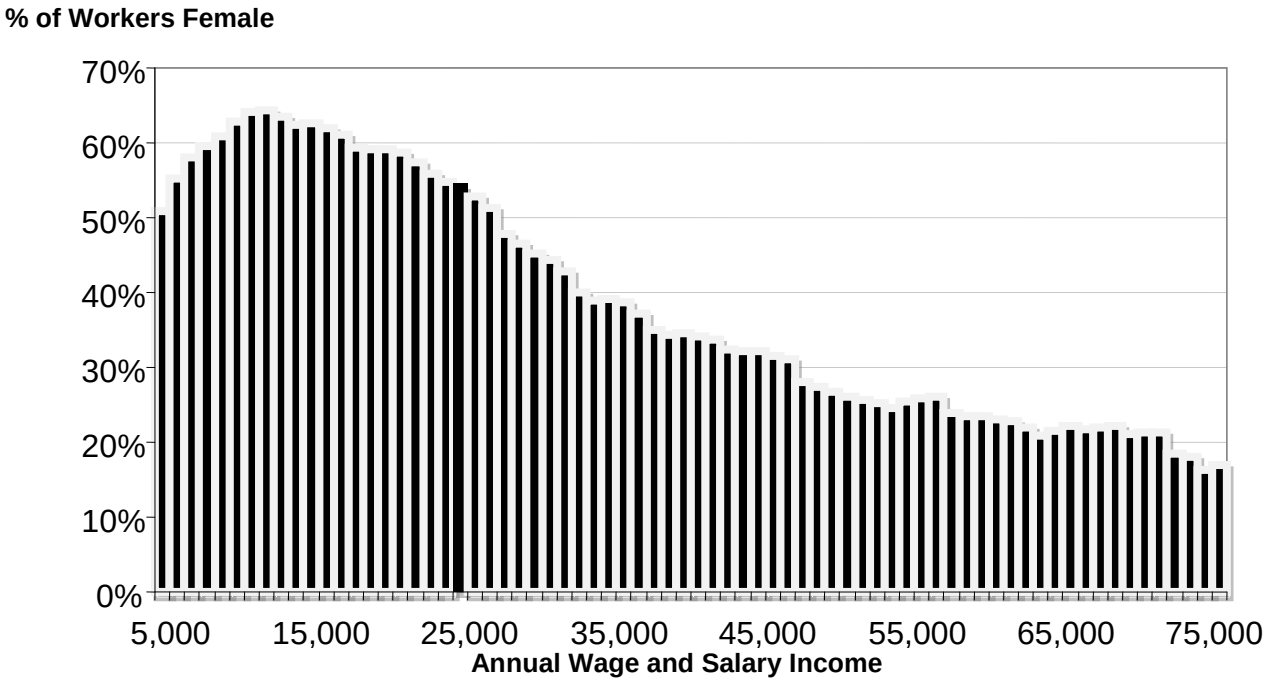
How might the state environment influence the wage gap? While these are not examined in this report, possibilities include several factors. Minimum-wage or living-wage laws may be related to the gender wage gap. Since two-thirds of minimum-wage workers are female, states with minimum wages above the current federal minimum of $5.15 per hour should have a smaller wage gap. Additionally state capitals tend to have more government employees, and the gender gap in the public sector tends to be lower because of civil service laws. Women's relative wages should therefore be higher in capital cities than other places, all other factors being equal. Finally, welfare assistance programs, with tighter eligibility requirements, could force more women into the low-wage work force, thus depressing overall wages (Bartik 1999).

Many of these theories are explored in further detail in the following sections. In the next section, we examine current gender disparities in pay in Pittsburgh. Following that, we compare gender wage gaps across the 100 largest metropolitan regions in the country and apply an explanatory model of gender wage gaps to the Pittsburgh workers.

Current Gender Disparities

This section documents gender disparities in earnings through a number of means. First, women in Pittsburgh are concentrated in lower income ranges. At the lowest levels of annual earnings, women make up 60 percent and more of the workers in each income category (see Figure 10). Women represent only one-fifth of the workers in the Pittsburgh region in the upper income ranges, $60,000 and over.

Figure 10. Percentage of Workers Who Are Female by Income Range, Full Time, Full Year Workers – Pittsburgh, 2000

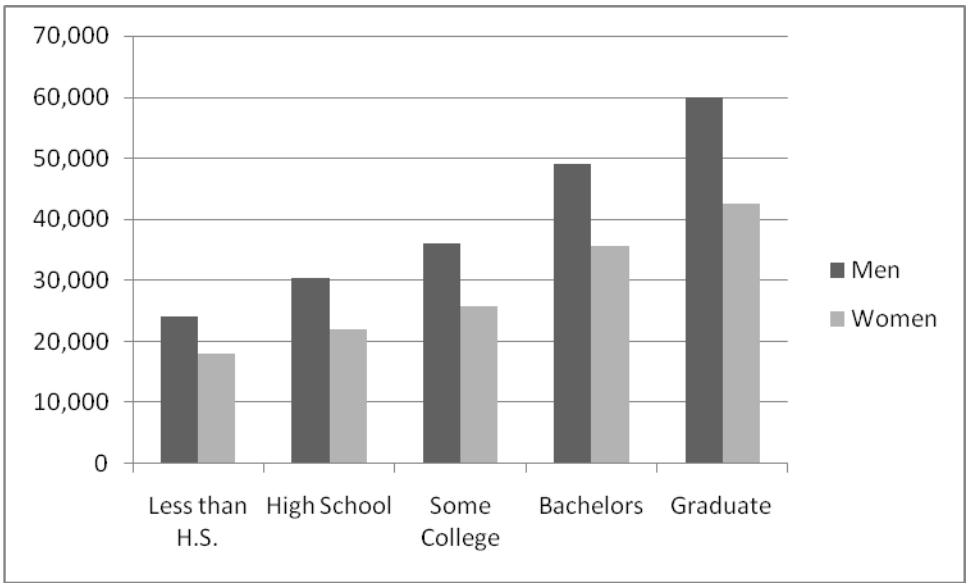


Compiled from 5% Census 2000 Public Use Microsample

In 2000, women in Pittsburgh tended to earn between 71 percent and 75 percent of male earnings, by highest level of education attained. As Figure 11 shows, across all levels of education, men in Pittsburgh earned more than women. Women with a bachelor's degree improved slightly over the 1990 figure, earning 73 percent of comparable male earnings in 2000.[2]

[2] These data do not control for other important factors, such as experience, occupation, and industry. See penultimate section on individual wage regression results.

Figure 11. Median Annual Earnings, Males and Females by Highest Level of Educational Attainment, Pittsburgh MSA, 2000



Earlier data suggested that women with college degrees also had lower earnings than men. Using 1990 Census data, Hansen, Murrell, and Weldon (1999) found that while men with a college degree earned $11 an hour more than male high school graduates, women with a college degree earned only $7 an hour more than female high school graduates. Women who were full-time, full-year workers with a bachelors' degree or higher in Allegheny County earned only 71 percent of what men earned. Survey research from the Career and Location Decisions (CLD) Project (funded by the Heinz Endowments and Mellon Foundation) documented striking gaps in reported earnings for recent Pittsburgh-area college graduates. As of 2001, only 35 percent of female graduates of the University of Pittsburgh, Duquesne University, or Carnegie Mellon earned more than $50,000 yearly, compared with 66 percent of comparable male graduates. The gender wage gap was significantly greater for local college graduates who remained in the Pittsburgh region than for those working elsewhere in the U. S. (Hansen and Huggins 2001: 36).

To examine these trends in more detail, we compare sets of occupation and industry data for the Pittsburgh region to the U.S., including employment and income. Research suggests that women still tend to concentrate in select occupations (Boraas and Rodgers 2003). These occupations are more likely to pay lower wages than traditional "male" occupations.

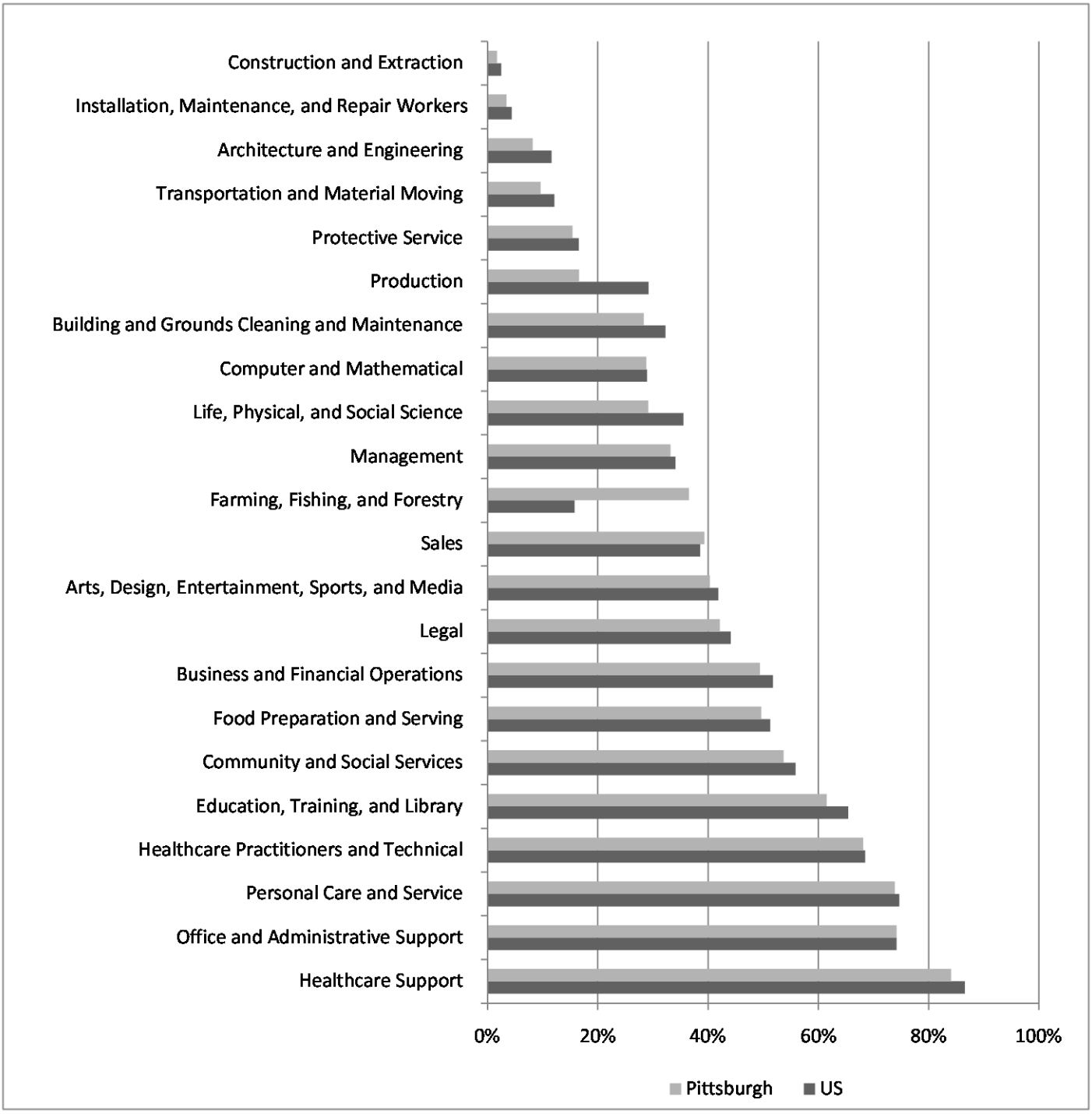
We first examine the distribution of women in Pittsburgh by occupation and compare the figures to U.S. averages (Figure 12). What might be considered traditional male occupations, such as construction, maintenance, and production, are toward the top of the graph, while occupations employing mostly females are toward the bottom.

Not surprisingly, in occupations such as healthcare support, office and administrative support, personal care and services, and healthcare practitioners, we find well over half the workers in these occupations are women. With the exception of healthcare support, the share of female

workers in these occupations essentially mirrors U.S. rates (see Figure 12). The difference between Pittsburgh's female share of the occupation and the U.S. female share of the occupation is less than two percent. The only occupation where females in Pittsburgh make up a larger share of employment than the U.S. is in sales, though the difference is negligible.

Women are less represented in traditionally male occupations, making up in some cases less than 20 percent of the workforce. This includes workers in construction and extraction; installation, maintenance and repair; architecture and engineering; transportation and material moving; protective services; and production workers. Even here, however, we see differences between Pittsburgh and the U.S. (see Figure 13). Women in Pittsburgh are even less likely to be employed in these traditional male industries, compared to women elsewhere in the U.S., especially for production workers, which shows the largest negative gap in the female share of employment between Pittsburgh and the U.S. The exception is farming, where females have a significantly larger share of employment in the sector in Pittsburgh than women in the U.S. In some of the higher paying occupations, notably life, physical and social science and business and finance, women in Pittsburgh represent a smaller share of the occupation than the U.S. average.

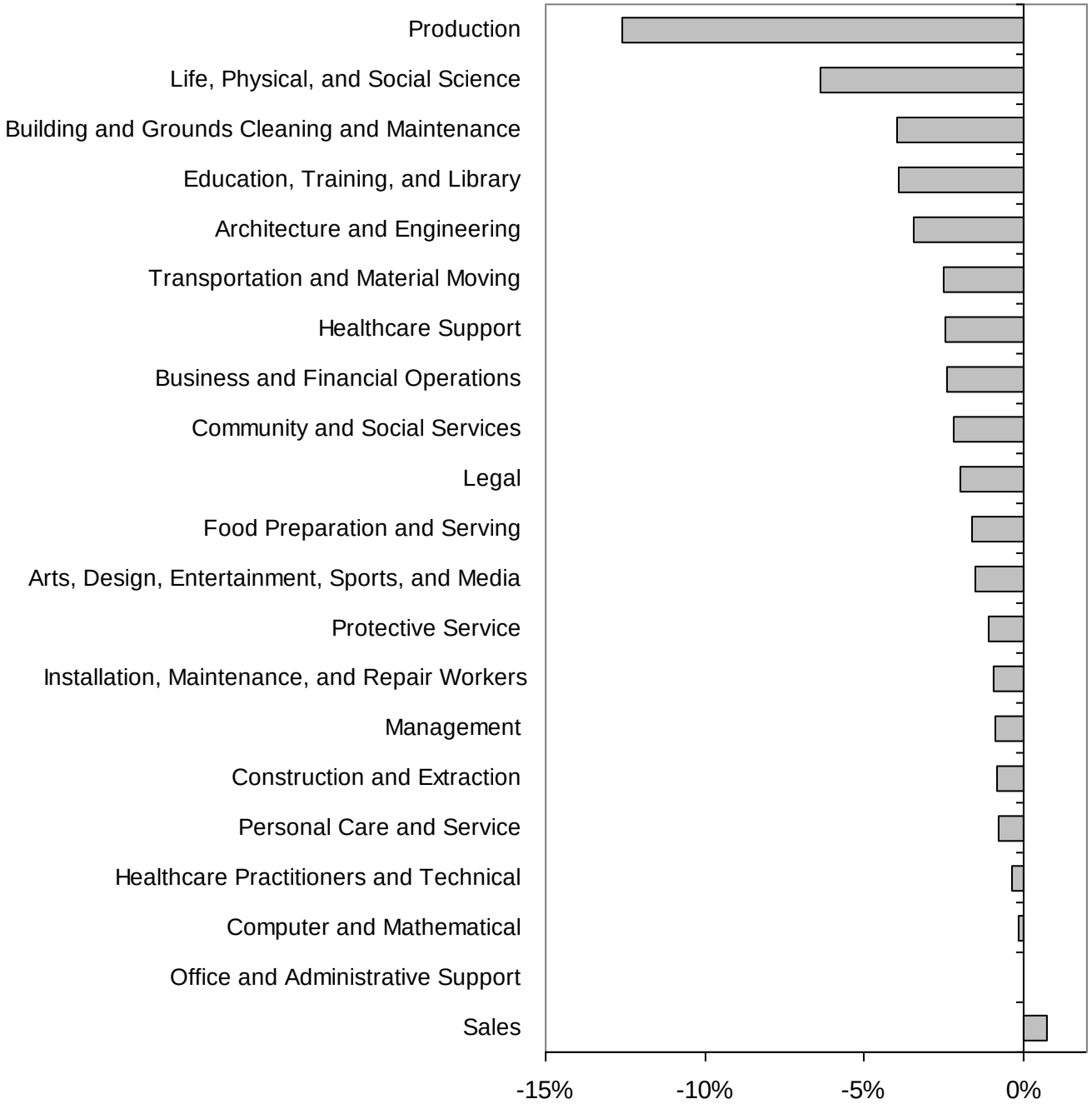
Figure 12. Percentage of Female Workers by Major Occupation. Pittsburgh vs. US - 2000



Source: Compiled from Census 2000 Public Use Microsample.

Figure 13. Difference in the Concentration of Female Workers in the US vs. Pittsburgh, by Major Occupation, 2000

(Negative # means Pittsburgh has lower percentage women compared to U.S.)



Source: Compiled from Census 2000 Public Use Microsample.

These occupational differences translate in earnings differences. In terms of median earnings, women in Pittsburgh exceed the U.S. in more occupations than their share of employment. However, and again, not surprisingly, women's median earnings fall short of men's in both Pittsburgh and the U.S. (see Figure 14).

Women in farming in Pittsburgh exceed both the U.S. average for women and exceed men's median earnings. Women employed in the installation, maintenance, and repair field match men's median earnings in Pittsburgh and exceed the U.S. average for earnings for women. The other occupations where women in Pittsburgh earn 80 percent or better than Pittsburgh men's median earnings include construction and extraction; healthcare support; arts, design, entertainment, sports and media; community and social services; life, physical and social science; and computer and mathematical area.

Management Occupations

How do women in Pittsburgh who are employed in higher paid occupations, such as the management field, fare against both men in Pittsburgh and women nationally? The table below examines this issue for the management occupation. Management is broken down across three sectors – nonprofit, commercial and government. Median earnings are given for the Pittsburgh region and the U.S. by gender for each sector for 2000.

A number of findings are important. Overall, women in management positions in Pittsburgh earned just 60 percent of men's earnings in management in Pittsburgh in 2000. Pittsburgh women in management also earned less than women in management nationally, at 90 percent share.

Women in management in Pittsburgh earn the highest median earnings in the government sector, compared to the nonprofit and commercial sectors, and exceed slightly U.S. median earnings for women in management in government. Additionally, women in government in management jobs earn the greatest share compared to men in both Pittsburgh and the U.S., both slightly below 80 percent of male median earnings.

Women in management positions in both the nonprofit and commercial sectors earn substantially less than men in Pittsburgh, 64.3 percent and 58.3 percent respectively. Women here also fare much worse than women nationally, earning 90 percent of what U.S. women in management make on average. Thus women in management in Pittsburgh in the nonprofit and commercial areas earn substantially less than median earnings in the sector nationally, faring worse than both men regionally and women nationally.

Major Occupation Group -- Management

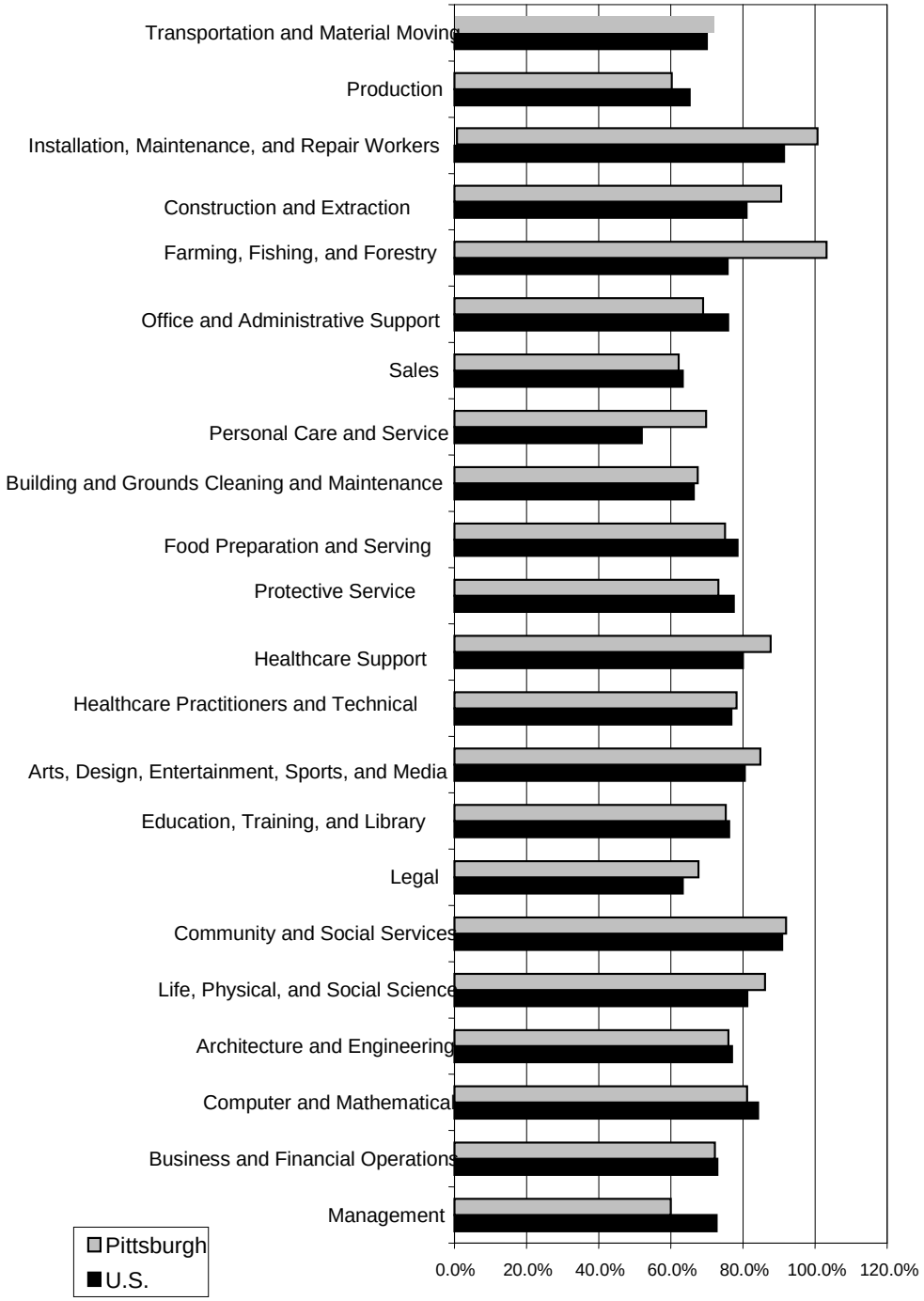
	Pittsburgh			U.S.			Pittsburgh to U.S.	
	Female	Male	Share	Female	Male	Share	Female	Male
NonProfit	$36,000	$56,000	64.3%	$40,000	$54,000	74.1%	90.0%	103.7%
Commercial	35,000	60,000	58.3%	39,100	55,000	71.1%	89.5%	109.1%
Government	44,400	57,000	77.9%	43,800	56,000	78.2%	101.4%	101.8%
All Sectors	36,000	60,000	60.0%	40,000	55,000	72.7%	90.0%	109.1%

Source: Public Use Microsample.

With the exception of the computer and mathematical field, these occupations are also included in the list of occupations where Pittsburgh women's median earnings exceed the U.S. average. In addition to the occupations above, women's earnings as a of share men's earnings in Pittsburgh also exceed average U.S. shares in: transportation and material moving; personal care and service; building and grounds cleaning; healthcare practitioners; and legal occupations (see Figure 15).

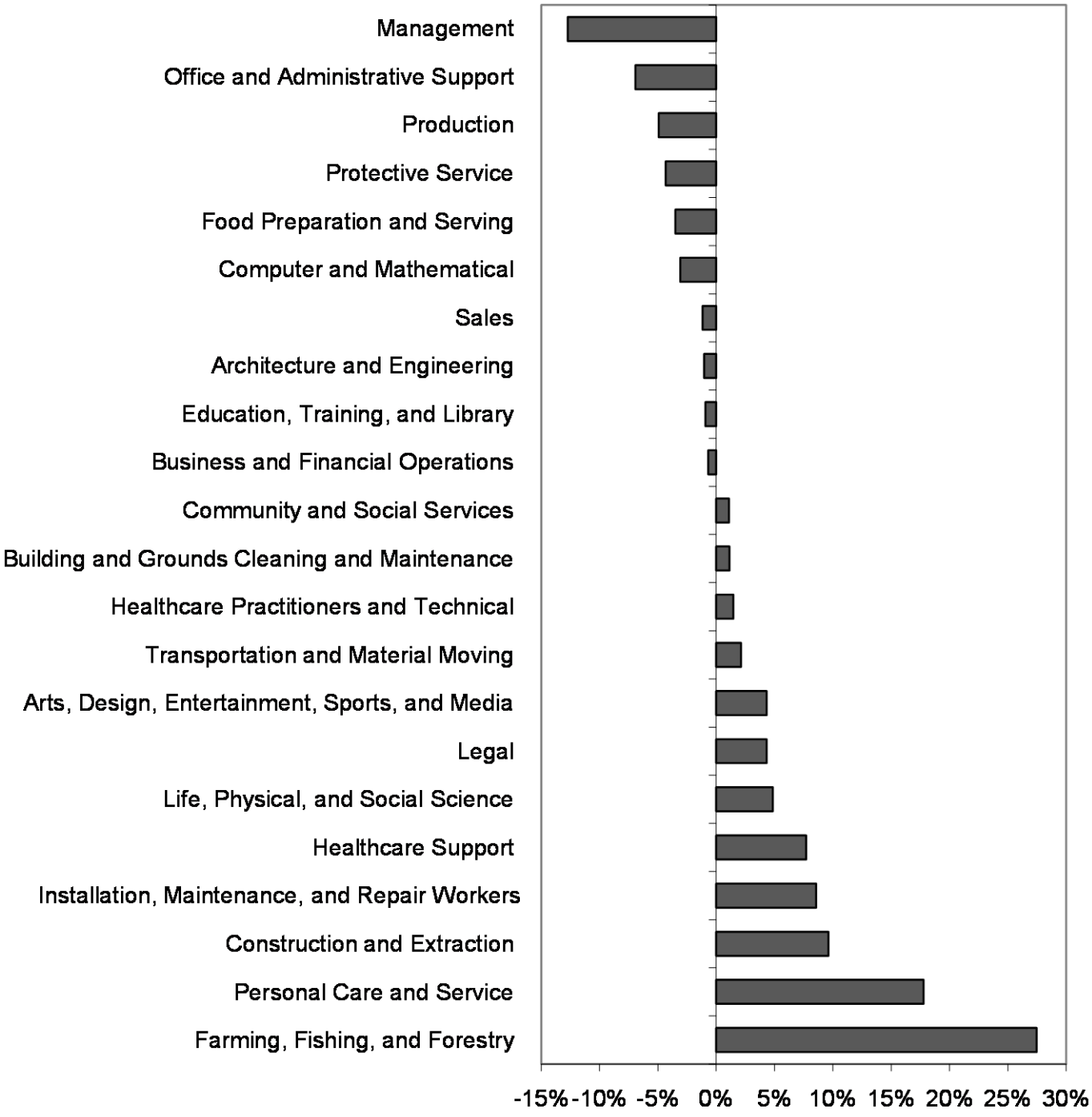
Figure 14. Women's Median Earnings as a Share of Men's Median Earnings, by Major Occupation, 2000

Pittsburgh and US - 2000



Source: Compiled from Census 2000 Public Use Microsample.

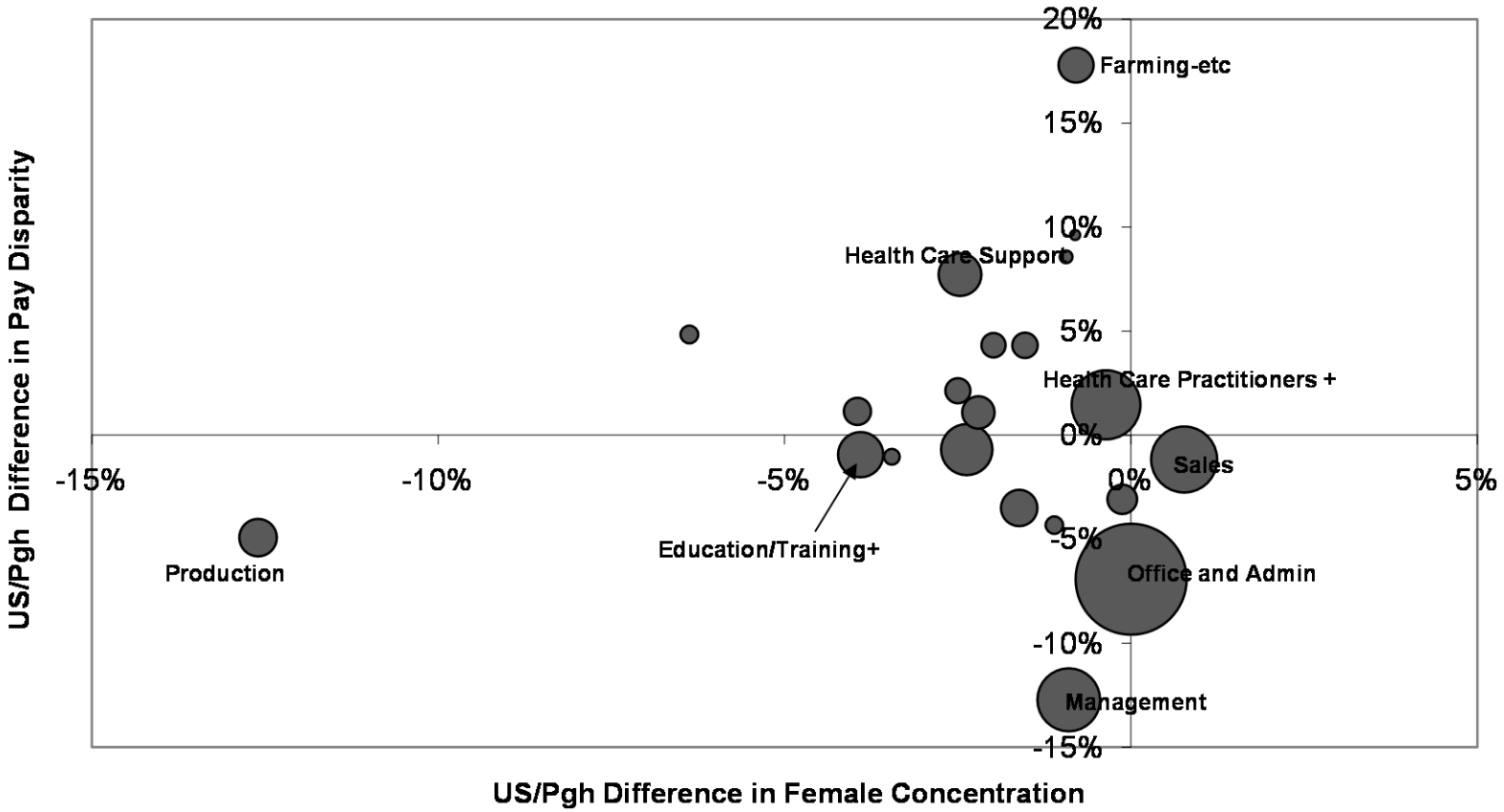
Figure 15. Relative Difference in Gender Wage Disparity, by Major Occupation, Pittsburgh vs. U.S., 2000



Source: Compiled from Census 2000 Public Use Microsample.

Figure 16 compares what occupations are most divergent from national patterns in terms of gender wage disparity and occupational segregation. Each bubble represents a particular major occupation with the size of the bubble representing the size of Pittsburgh region workers in that occupation. The placement of the bubble tells you how different the local occupational workforce is from national patterns. The vertical axis measures how different the local pay disparity is from what is typical across the country. The horizontal axis measure how different the concentration of women in an occupation is from national levels. Thus a bubble near the (0,0) center does not mean that pay and concentration levels are similar between men and women, but that the percentage of women in the occupation and pay disparity is similar in Pittsburgh to what is measured for the nation as a whole. The more notable occupations are ones farther from the center with an obvious emphasis on the industries that are bigger.

Figure 16. Female Concentration vs. Pay Disparity by Major Occupation – Pittsburgh Region 2000



We next compare the share of women in an industry in Pittsburgh to the share in the U.S., as we did above for occupations. The industries are sorted from lowest shares of women in industry employment – construction, mining and agriculture – to those industries with the highest shares of female employment – educational services, finance and insurance, and health care and social assistance.

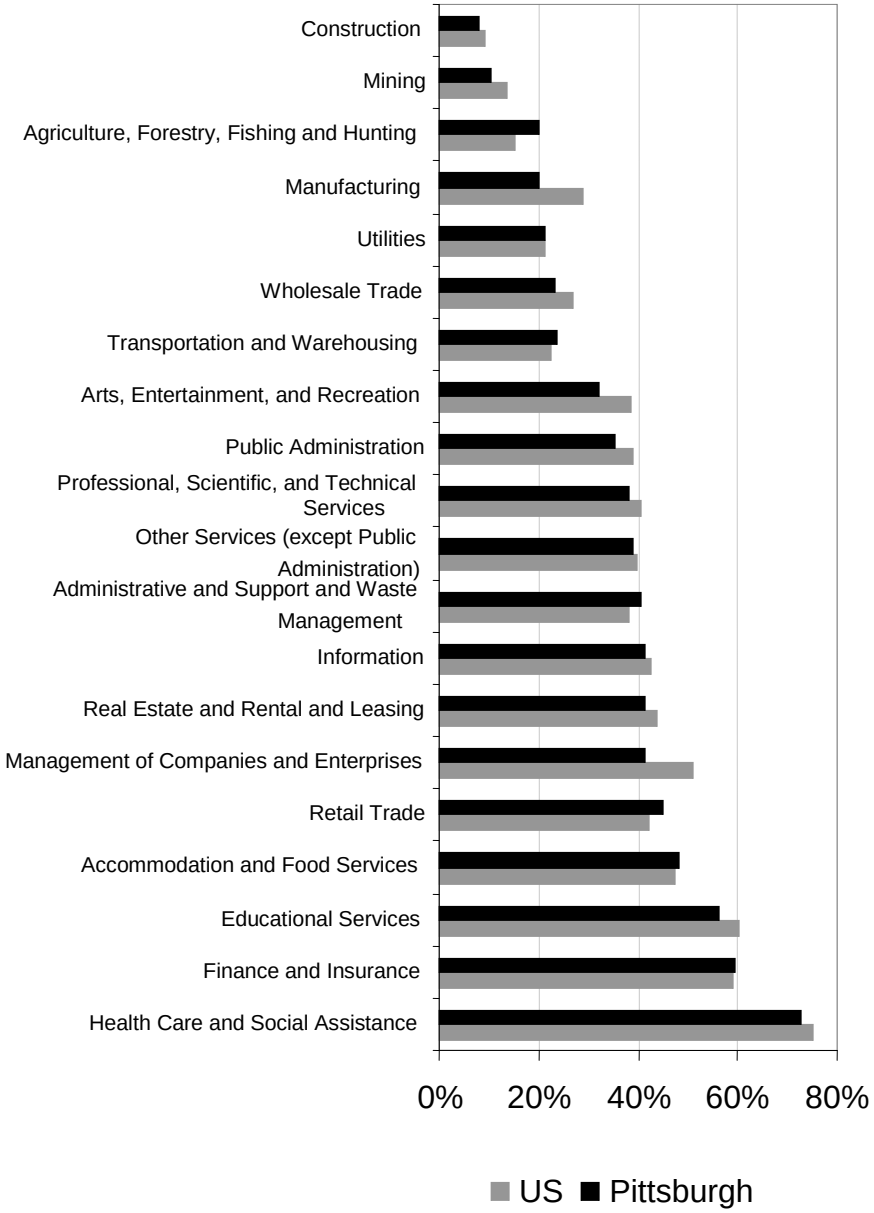
Here we find a similar pattern: Women in Pittsburgh tend to be underrepresented in some industries as a share of total employment compared to women nationally. In nearly all major industry groups shown, women in Pittsburgh are less represented as a share of total employment in that industry compared to women nationally (see Figure 17).

The largest differences between Pittsburgh and the U.S. in the share of female workers in an industry are in manufacturing and management (see Figure 18). This suggests that the Pittsburgh region, employing significantly larger numbers and shares of women in most industries, has not changed as much in its traditional industries as has the rest of the nation.

The only significant industry in which the share of women in the sector in Pittsburgh exceeds the share of women in the sector nationally is in agricultural industry. Pittsburgh women register a slightly higher share than U.S. women in retail trade. In several other industries, the share of women in the industry is equal or an insignificant difference between Pittsburgh and the U.S. They include: utilities, other services, information, accommodation and food services, and finance and insurance.

Figure 19 compares differences in the gender wage gap between Pittsburgh and the U.S. First, all industries show significant wage gaps, with those at the top of the figure registering the largest. This includes management of companies, finance and insurance, and professional, scientific and technical services. Comparing earnings by gender, women in Pittsburgh fare worse than women nationally in all industry groups except four (see Figure 20). These include real estate, other services, utilities, and, interestingly, manufacturing. So while women in Pittsburgh are less represented than women in manufacturing nationally, they earn a slightly higher share of men's earnings than women on average.

Figure 17. Percentage of Female Workers by Major Industry, Pittsburgh vs. U.S., 2000
Sorted by Percentage Female in Pittsburgh Industries



Compiled from Census 2000 Public Use Micro Sample (PUMS)

Figure 18. Difference in the Concentration of Female Workers, by Major Industry, Pittsburgh vs. U.S., 2000

Negative percentages mean Pittsburgh has a lower share of female workers compared to the U.S.

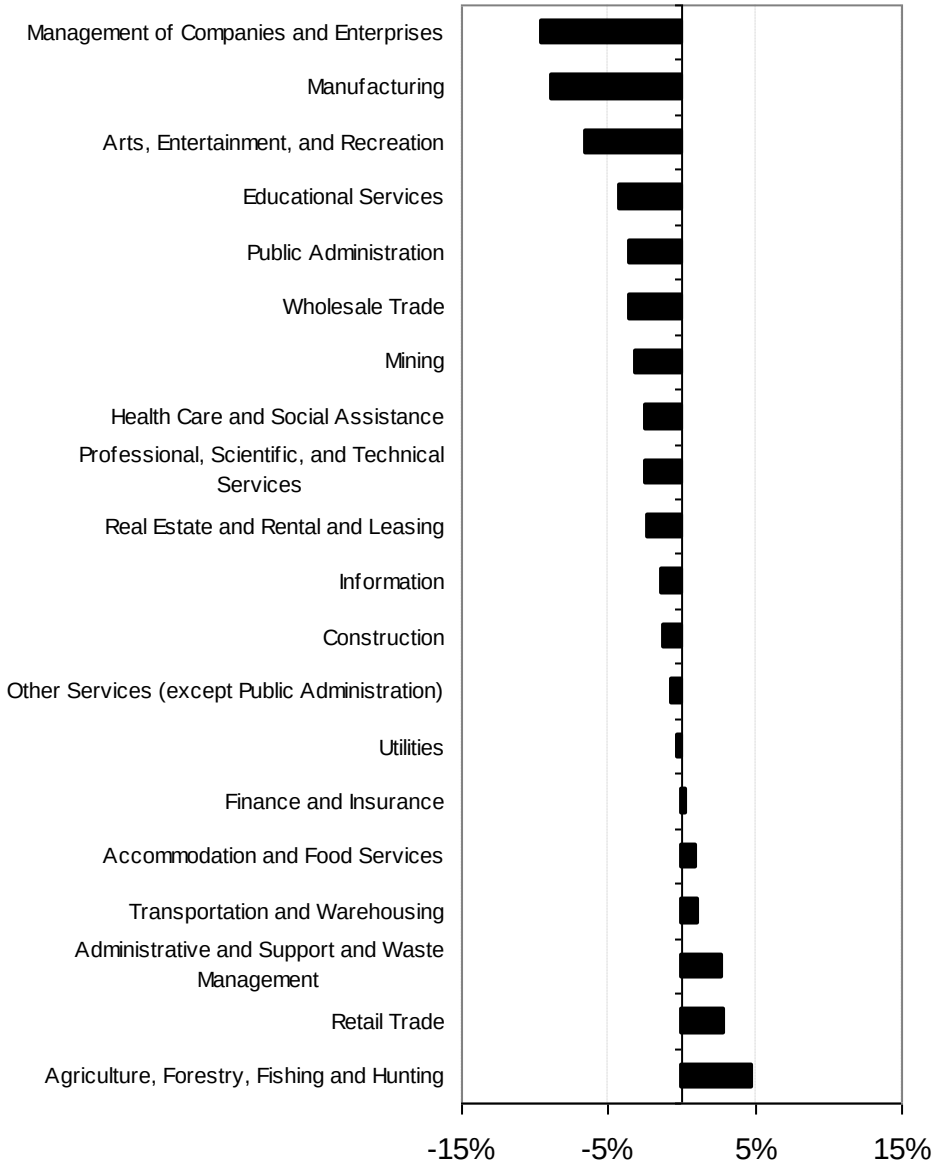
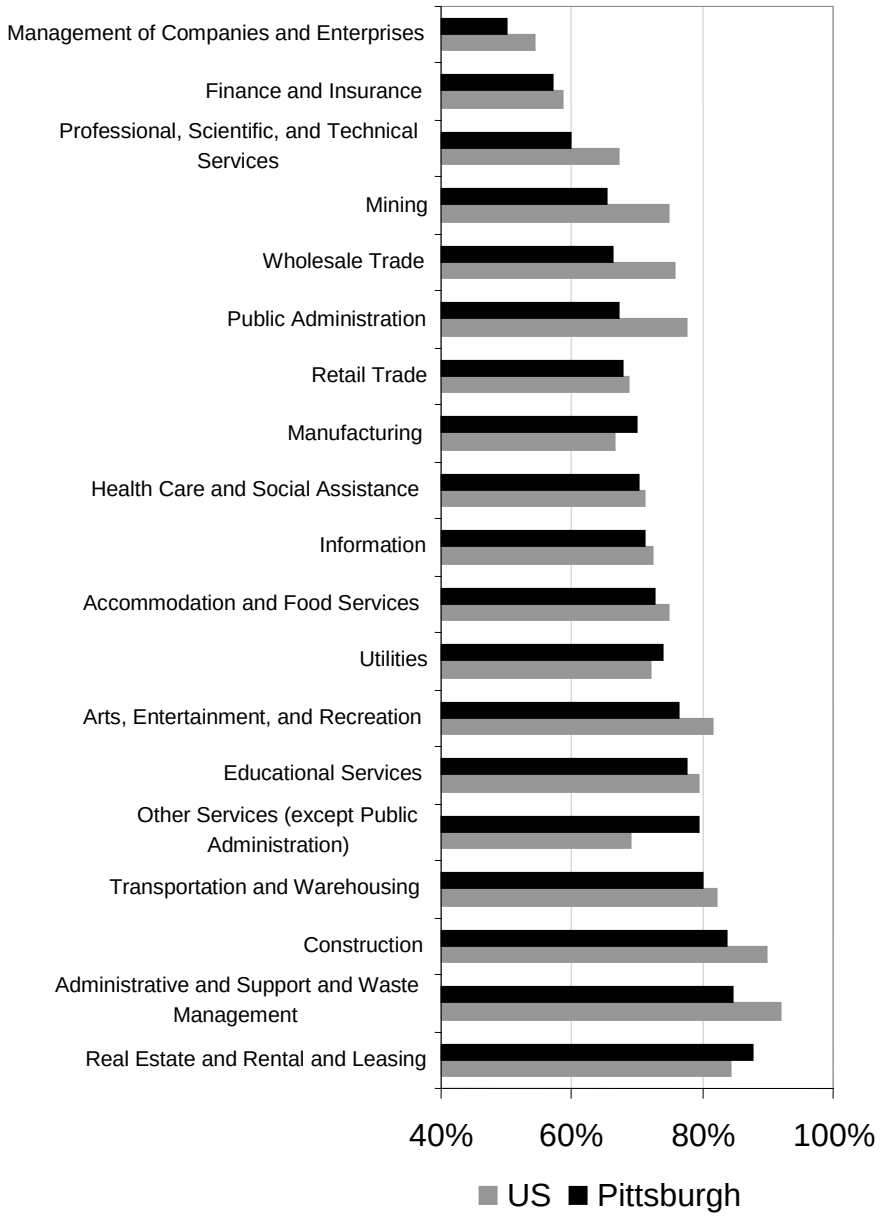


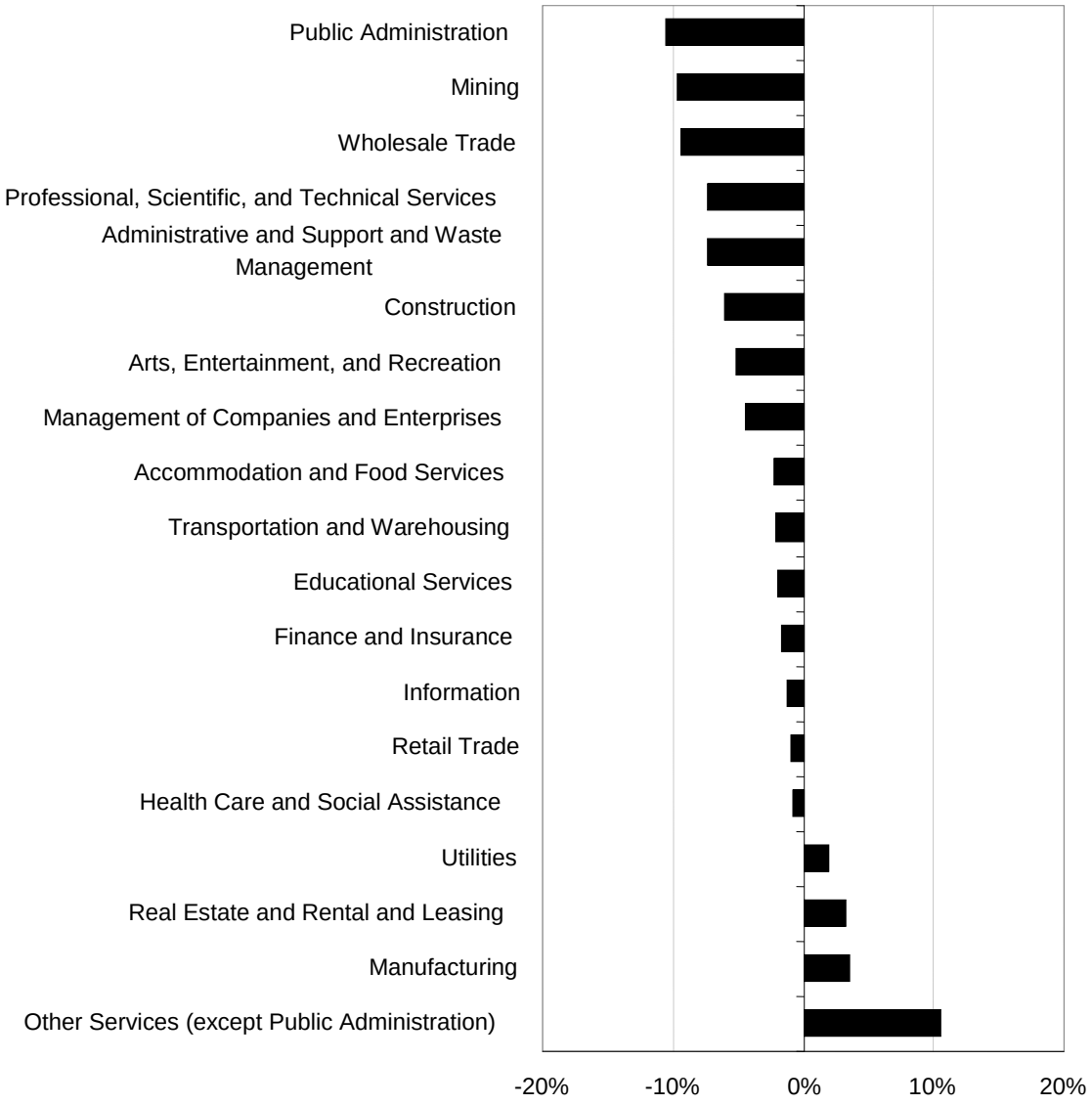
Figure 19. Women's Median Earnings as a Share of Men's Median Earnings, by Major Industry, Pittsburgh vs. U.S., 2000



Compiled from Census 2000 Public Use Micro Sample (PUMS)

Figure 20. Relative Difference in Gender Wage Disparity by Major Industry, Pittsburgh vs. U.S., 2000

Positive values mean the wage gap in Pittsburgh is smaller than the comparable wage gap in the nation.



Finally, we compare the distribution of male and female salary income in Pittsburgh by race. Adding to the region's persistent gender wage differences are the persistent and significant differences in earnings by race. In 1999, African American women earned somewhat less than white women in Pittsburgh (see Figure 21). Their earnings are skewed toward lower wage and salary levels. However, even though African American women earn less on average than white women in Pittsburgh, the differences are relatively small. African American men, on the other hand, earn substantially less than white men (see Figure 22). Their earnings profile appears to resemble women's earnings profile much more than white men's.

Figure 21. Distribution of Total Wage and Salary Income in 1999. Women Only by Race
Full time Full year Workers – Pittsburgh MSA

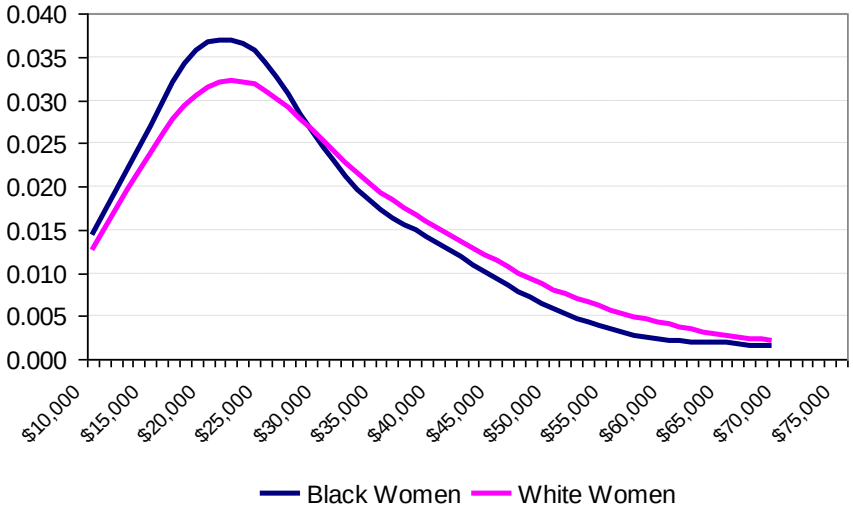
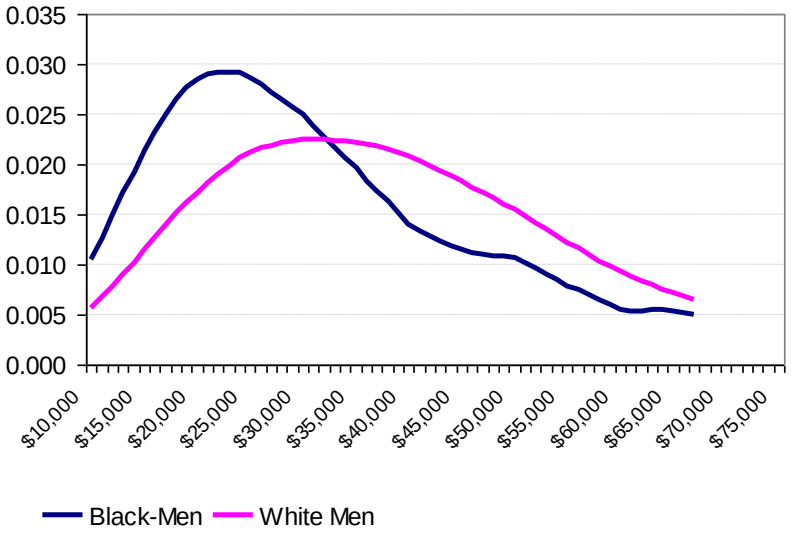


Figure 22. Distribution of Total Wage and Salary Income in 1999 - Men Only by Race
Full time Full year Workers – Pittsburgh MSA



Metropolitan Comparisons in Wage Disparities

This section compares gender wage disparities between Pittsburgh and other metropolitan regions. Understanding regional differences has been important in analyses of racial wage inequality (Bound and Freeman 1992; Holzer 1998; McCall 2000), but has been less studied than other areas. We use the largest 100 metropolitan regions in the country, by Census 2000 population.

Occupation and Industry Segregation

How are men and women distributed across occupations and industries? That is, compared to a hypothetical equal distribution of men and women across all occupations and industries, how does Pittsburgh fare? And how does it compare to other metropolitan areas.

Segregation indexes were constructed to compare differences in segregation by occupation and industry across metropolitan areas. These used the index of dissimilarity to compare segregation by industry and occupation across the largest 100 metropolitan areas. The index of dissimilarity measures the difference between the distribution of men and women across industries occupations. If men and women are distributed evenly across categories, the distribution is completely equal and the index equals 0. If men and women are totally different as to their distribution across industries or occupational categories, the index equals 1, representing complete dissimilarity (see Appendix B for data). Specifically, the index can be expressed as:

$$S_{msa} = 1/2 * \sum_{industry} \left| \frac{m_{industry}^{msa}}{M_{msa}} - \frac{f_{industry}^{msa}}{F_{msa}} \right|$$

Where m_i = the number of male workers in the i^{th} occupation.
M = the total male workers in the region.
f_i = the number of female workers in the i^{th} occupation.
F = the total female workers in the.region.

The Pittsburgh metropolitan region registered relatively high segregation indexes for both occupation and industry (see Table 2). Its occupation index is lower in relative terms, suggesting there is less segregation by occupation in Pittsburgh than segregation by industry. Its industry segregation index ranks 81st worst among the 100 largest metropolitan regions. Through industrial restructuring, the region is today less segregated by industry today, but remains relatively high compared to other places. With an index of 31.3 for industry segregation, this suggests that nearly one third of the workforce would have to change jobs to achieve complete equality with an index of dissimilarity of 0.

Table 2. Segregation and Occupational Indexes for Pittsburgh, 2000

	Pittsburgh	Rank (100 largest metros)
Occupation	32.1	74th
Industry	31.3	81st

In examining the top 10 metropolitan areas in terms of lowest and highest segregation by industry and occupation, the San Francisco region scores lowest on both measures, thus displaying the least amount of occupation and industry segregation (see Table 3). Other metropolitan regions ranked in the top group for both measures include Washington-Baltimore, Honolulu, and New York.

At the other end, registering the highest index of dissimilarity – and thus the highest levels of segregation – were Saginaw-Bay City, Michigan, for industry segregation and Mobile, Alabama, for occupation segregation. Both of them were ranked in the bottom ten in both indexes, along with Johnson City, Tennessee, Baton Rouge, Louisiana, and Bakersfield, California. For full table of all 100 metropolitan areas, please see Appendix B.

Table 3. Metropolitan Areas with the Lowest and Highest Segregation Indexes, 2000

Highest and Lowest Rankings by Industry and Occupation Segregation Indexes	Metropolitan Area	Index
Lowest Industry Segregation Index	San Francisco--Oakland--San Jose, CA CMSA	22.4%
	Miami--Fort Lauderdale, FL CMSA	22.5%
	Washington--Baltimore, DC--MD--VA--WV CMSA	23.3%
	Honolulu, HI MSA	23.4%
	Los Angeles--Riverside--Orange County, CA CMSA	23.6%
	Orlando, FL MSA	23.8%
	New York--Northern New Jersey--Long Island, NY—NJ	23.8%
	Las Vegas, NV--AZ MSA	24.1%
	Denver--Boulder--Greeley, CO CMSA	24.4%
	Tampa--St. Petersburg--Clearwater, FL MSA	24.5%
Lowest Occupation Segregation Index	San Francisco--Oakland--San Jose, CA CMSA	20.1%
	Boston--Worcester--Lawrence, MA--NH--ME--CT CMSA	22.3%
	Washington--Baltimore, DC--MD--VA--WV CMSA	22.4%
	New York--Northern New Jersey--Long Island, NY—NJ	22.4%
	Austin--San Marcos, TX MSA	22.6%
	Madison, WI MSA	22.6%
	Raleigh--Durham--Chapel Hill, NC MSA	22.7%
	San Diego, CA MSA	23.4%
	Honolulu, HI MSA	24.4%
	Columbus, OH MSA	24.7%
Highest Industry Segregation Index	Wichita, KS MSA	34.0%
	Toledo, OH MSA	34.2%
	Johnson City--Kingsport--Bristol, TN--VA MSA	34.3%
	Lancaster, PA MSA	34.5%
	Bakersfield, CA MSA	34.8%
	Baton Rouge, LA MSA	35.2%
	Augusta--Aiken, GA--SC MSA	35.8%
	Canton--Massillon, OH MSA	37.0%
	Mobile, AL MSA	37.1%
	Saginaw--Bay City--Midland, MI MSA	37.8%
Highest Occupation Segregation Index	Fresno, CA MSA	35.4%
	McAllen--Edinburg--Mission, TX MSA	35.4%
	Baton Rouge, LA MSA	35.4%
	Bakersfield, CA MSA	36.0%
	Saginaw--Bay City--Midland, MI MSA	36.1%
	Johnson City--Kingsport--Bristol, TN--VA MSA	36.2%
	Stockton--Lodi, CA MSA	37.1%
	Modesto, CA MSA	37.6%
	Lakeland--Winter Haven, FL MSA	38.1%
	Mobile, AL MSA	38.7%

Gender Wage Differences by Educational Levels

We examined the median earnings of men and women in the largest 100 metropolitan areas by educational levels. Again, Pittsburgh ranked from the middle to the highest ends of earnings differentials. The results are summarized below:

Table 4. Pittsburgh's Ranking of the Gender Wage Gap* by Educational Level, Among Largest 100 MSAs, 2000

	Educational Level					
Pittsburgh	**All full time, full year workers**	**< High school**	**High school**	**Some college**	**Bachelors degree**	**Graduate degree**
Figure	68.8	75.0	72.4	71.4	72.9	70.8
Rank	87th	30th	57th	70th	47th	60th
Range for 100 MSAs	62-95	57-82	57-87	60-88	64-83	58-100

* Range from 1 – 100, with 100 most dissimilar or largest gap among 100 largest metropolitan areas.

Pittsburgh's ranking scores best for female to male earnings for those with less than a high school degree. Here Pittsburgh women earn 75 percent of median male earnings and rank 30th among the 100 largest MSAs. Women with a bachelor's degree as the highest attained educational level received 72.9 percent of median earnings for men with comparable educational attainment. Pittsburgh was in the top half of MSAs for these women, ranking 47th. Ranking in the lower half of the nation were the remaining education attainment divisions. Women with some college or a graduate degree fared worse against Pittsburgh men, with just 71 percent of median male earnings. Overall, however, Pittsburgh women, on average, fare even worse, earning 69 percent of median male earnings, ranking Pittsburgh 87th of the top 100 metropolitan areas in the gender wage gap.

Cluster Analysis: Identifying Groups by Wage Gap and Segregation Indexes

We performed a cluster analysis of the variables used to identify gender wage differences by highest level of educational attainment and differences in occupational and industry segregation by gender for the 100 largest MSAs (Coulton et al. 1996; Hill and Brennan 2000) The variables and descriptive statistics follow in Table 5.[3]

Table 5. Variables and Descriptive Statistics

Variables	Mean	Std. Deviation	Minimum	Maximum
Gender wage ratio, median female earnings to	0.740	0.048	0.621	0.950

[3] Three metropolitan regions were eliminated from the final analysis: McAllen, Texas, and Fresno and Modesto, California. McAllen clustered with itself and Fresno and Modesto clustered with each other. Eliminating the Fresno and Modesto cluster did not affect the composition of the other four clusters analyzed here.

median male earnings, full time, full year, all workers				
Gender wage ratio of median female earnings to median male earnings, full time, full year workers, less than high school education only	0.718	0.055	0.571	0.836
Gender wage ratio of median female earnings to median male earnings, full time, full year workers, high school graduates only	0.726	0.057	0.574	0.867
Gender wage ratio, median female earnings to median male earnings, full time, full year workers, some college only	0.739	0.051	0.595	0.876
Gender wage ratio, median female earnings to median male earnings, full time, full year workers, bachelors degree only	0.730	0.041	0.640	0.830
Gender wage ratio, median female earnings to median male earnings, full time, full year workers, graduate degree only	0.722	0.062	0.581	1.000
Segregation Index – Industry	0.465	0.053	0.355	0.597
Segregation Index – Occupation	0.328	0.046	0.209	0.439

All data are 2000.

The results found five clusters of metropolitan regions, ordered here from most equal to least equal (see Table 6).

Group 1: Most equitable environments: Lowest segregation indexes coupled with most equal female-male earnings by educational attainment.

This group clustered together the metropolitan areas with the lowest segregation indexes and most equal female to male earnings by educational level. These metropolitan areas can be considered to have the best earnings for women vis a vis men by educational level.[4]

The group includes 13 state capitals plus Washington, D.C. Capital regions are expected to have more equal female-to-male earnings ratios because of the influence of government employment, civil service requirements, and public sector unions. This cluster also includes growth centers, including some of the fastest growing places in the country, such as Las Vegas. We found that the regions with the lowest segregation indexes and lowest female-male earnings differences

[4] This analysis does not measure nor rank racial, ethnic nor class inequality and makes no link to them based on the gender analysis.

were also among the fastest growing regions in terms of population and employment, on average.

Group 2: Least equitable environments: High earnings disparities across educational levels and very high segregation indexes

This group of metropolitan regions lie at the other end of the equity spectrum – very high segregation indexes by occupation and industry coupled with relatively high gender wage gaps by educational level. The group is somewhat scattered, but is concentrated in the smaller southern regions and the industrial Midwest.

Group 3: Middle ground environments: Mixed rankings among gender wage gaps and segregation indexes tending toward the middle of the distribution

Group 3 represents metropolitan regions that are not significantly at either end of the gender wage gap and segregation index rankings. In general, the rankings tend toward what might be he middle or average of rankings. They also as a group include many smaller and medium-sized expanding metropolitan regions, with a strong tilt toward the growing southern and western regions of the country. Philadelphia and Harrisburg, are the notable exceptions here, both in Pennsylvania.

Group 4: Inequitable environments: Generally poor rankings on all educational returns and relatively high levels of segregation indexes

This group represents a group of metropolitan areas that generally score toward less equity in both gender wage gap measures and segregation indexes. Though not the worst on all measures, metropolitan regions in this group tend toward less equality on nearly all scores and fall in the lower quarter and half of the rankings. The metropolitan regions in this group lie primarily, but not exclusively, in the northeast and midwest, representing what used to be called the Rust Belt communities. There are certainly exceptions to this, with metropolitan regions in both the south and west in this group. Many of the metropolitan regions in this group are also slower growing, on average, than those in groups 1 and 3. Pittsburgh falls into group 4, along with three other Pennsylvania metropolitan regions, Allentown, Lancaster, and Scranton.

The cluster analysis points to a number of important findings. The group where women fare the best in terms of both segregation indexes and gender wage differences is Cluster 1, a group comprising a set of state capitals and fast growing regions. Here we find metropolitan regions which had a combination of both low segregation indexes and relatively more equal earnings between men and women across educational levels. We can conclude that both the state capital effect and population/employment growth effects are related to more equitable earnings environments for women.

The Pittsburgh MSA scores in a group that is 2nd worse in terms of occupational and industry segregation and earnings differences between men and women across the educational breakdown. This group also contains the Allentown, Lancaster and Scranton metropolitan regions in Pennsylvania. Thus, earnings equity for women compared to men is also lower, on average, in other parts of the state. In other parts of Pennsylvania, in addition to Pittsburgh, the legacy of the older industrial economy may also continue to hold down women's pay. The two

regions of the state that performed better on the equity indexes were Philadelphia and Harrisburg, where growth is faster than in other parts of the state. Also, Harrisburg, as the state's capital, would be expected to have more equitable earnings distribution.

Table 6. 100 Largest MSAs/CMSAs in Clusters Based on Gender Wage Gaps by Educational Level, 2000

Cluster 1: Most Equitable Environments – Lowest segregation indexes and most equal female-male earnings by educational level

Albany--Schenectady--Troy, NY	MSA
Atlanta, GA	MSA
Austin--San Marcos, TX	MSA
Boston--Worcester--Lawrence, MA--NH--ME--CT	CMSA
Columbus, OH	MSA
Denver--Boulder--Greeley, CO	CMSA
El Paso, TX	MSA
Hartford, CT	MSA
Honolulu, HI	MSA
Las Vegas, NV--AZ	MSA
Los Angeles--Riverside--Orange County, CA	CMSA
Madison, WI	MSA
Miami--Fort Lauderdale, FL	CMSA
Minneapolis--St. Paul, MN--WI	MSA
New York—No. New Jersey--Long Island, NY—NJ	CMSA
Omaha, NE--IA	MSA
Phoenix--Mesa, AZ	MSA
Raleigh--Durham--Chapel Hill, NC	MSA
Sacramento--Yolo, CA	CMSA
San Antonio, TX	MSA
San Diego, CA	MSA
San Francisco--Oakland--San Jose, CA	CMSA
Sarasota--Bradenton, FL	MSA
Seattle--Tacoma--Bremerton, WA	CMSA
Tampa--St. Petersburg--Clearwater, FL	MSA
Washington--Baltimore, DC--MD--VA--WV	CMSA
West Palm Beach--Boca Raton, FL	MSA

Cluster 2: Least Equitable Environments: Highest earnings disparities across educational levels and highest segregation indexes

Augusta--Aiken, GA--SC	MSA
Bakersfield, CA	MSA
Baton Rouge, LA	MSA
Canton--Massillon, OH	MSA
Detroit--Ann Arbor--Flint, MI	CMSA
Johnson City--Kingsport--Bristol, TN--VA	MSA
Mobile, AL	MSA
Saginaw--Bay City--Midland, MI	MSA
Toledo, OH	MSA

Cluster 3: Middle Ground Environments: Mixed rankings among gender wage gaps and segregation indexes, tending toward the middle of the distribution

Albuquerque, NM	MSA
Boise City, ID	MSA
Charlotte--Gastonia--Rock Hill, NC--SC	MSA
Cincinnati--Hamilton, OH--KY--IN	CMSA
Colorado Springs, CO	MSA
Columbia, SC	MSA
Dallas--Fort Worth, TX	CMSA
Daytona Beach, FL	MSA
Des Moines, IA	MSA
Fort Myers--Cape Coral, FL	MSA
Greensboro--Winston-Salem--High Point, NC	MSA
Greenville--Spartanburg--Anderson, SC	MSA
Harrisburg--Lebanon--Carlisle, PA	MSA
Houston--Galveston--Brazoria, TX	CMSA
Jacksonville, FL	MSA
Kansas City, MO--KS	MSA
Knoxville, TN	MSA
Lexington, KY	MSA
Little Rock--North Little Rock, AR	MSA
Melbourne--Titusville--Palm Bay, FL	MSA
Memphis, TN--AR--MS	MSA
Nashville, TN	MSA
Oklahoma City, OK	MSA
Orlando, FL	MSA
Philadelphia--Wilmington—Atl. City, PA--NJ—DE	CMSA
Portland--Salem, OR--WA	CMSA
Richmond--Petersburg, VA	MSA
Salt Lake City--Ogden, UT	MSA
Tucson, AZ	MSA

***Cluster 4: Inequitable Environments*: Generally poor rankings on all educational returns and relatively high levels of segregation indexes**

Allentown--Bethlehem--Easton, PA	MSA	Louisville, KY--IN	MSA
Birmingham, AL	MSA	Milwaukee--Racine, WI	CMSA
Buffalo--Niagara Falls, NY	MSA	New Orleans, LA	MSA
Charleston--North Charleston, SC	MSA	Norfolk--Virginia Beach--Newport News, VA--NC	MSA
Chattanooga, TN--GA	MSA	Pensacola, FL	MSA
Chicago--Gary--Kenosha, IL--IN--WI	CMSA	Pittsburgh, PA	MSA
Cleveland--Akron, OH	CMSA	Providence--Fall River--Warwick, RI--MA	MSA
Dayton--Springfield, OH	MSA	Rochester, NY	MSA
Fort Wayne, IN	MSA	St. Louis, MO--IL	MSA
Grand Rapids--Muskegon--Holland, MI	MSA	Scranton--Wilkes-Barre--Hazleton, PA	MSA
Indianapolis, IN	MSA	Spokane, WA	MSA
Jackson, MS	MSA	Springfield, MA	MSA
Kalamazoo--Battle Creek, MI	MSA	Stockton--Lodi, CA	MSA
Lakeland--Winter Haven, FL	MSA	Syracuse, NY	MSA
Lancaster, PA	MSA	Tulsa, OK	MSA
Lansing--East Lansing, MI	MSA	Wichita, KS	MSA

Individual Wage Regression Results

Finally, we turn to an examination of individual earnings in the Pittsburgh metropolitan area and what factors may determine the gender wage gap that we've witnessed and discussed throughout this report. After examining the relations in the gender wage gap and earnings distribution across a number of factors in Pittsburgh, we present a model where which explains some of the factors determining these differences in wages by gender, including discrimination in the regional labor market. This model uses the *Oaxaca methodology* to examine the Pittsburgh labor market and compare these results to similar analyses of the national labor market. The results will be used to determine whether there is any significant difference in the causes of discrimination in Pittsburgh compared to what is typical for the United States.

The Oaxaca Methodology

A traditional method for measuring discrimination in the workforce is the use of the Blinder-Oaxaca decomposition. This technique dates from the 1970's and has since become a standard method in labor economics for measuring the causes of wage discrimination between different subgroups of the workforce per both Oaxaca (1973) and Blinder (1973). The initial application was to use the technique to measure wage discrimination by race in the workforce, but it has since been used extensively to measure gender wage discrimination, as well as discrimination between other subgroups within the labor force.

The goal of the Oaxaca decomposition is to break down an observed difference in wages between two subgroups into that which can be attributed to observed differences in the characteristics of the two groups and that which is unexplained. Observed differences include variables such as education, experience, age, etc. As we discussed above, in the case of gender wage discrimination, there are often significant differences in the observed characteristics of women in the workforce compared to men, with men in the workforce usually receiving higher returns to investments in human capital. Because of these differences in characteristics, a simple comparison of mean or median wages gives only limited insight into the causes of an observed wage gap.

The Oaxaca technique is a decomposition that attempts to measure the proportion of an observed wage gap that can be attributable to the differences in characteristics between subgroups of the population. After accounting for differences in the gender wage gap determined by the observed differences between women and men, what is left then is the proportion of the wage gap that is not explained by differences in observed characteristics. This unexplained portion of the wage gap is considered to be caused by discrimination; it is also sometimes labeled "statistical discrimination."

Applying the Oaxaca Decomposition to the Pittsburgh Labor Market.

Most studies of the gender wage gap look at the national labor market and national wage structures (Boraas and Rodgers 2003; O'Neill 2003a; O'Neill 2003b). Thus the results give insight into what the national causes are for the gender wage gap. Boraas and Rodgers (2003)

found that though there are other contributions to the gender wage gap, the share of women in an occupation is the largest determinant of the gender wage gap at the national level.

Much less analysis makes use of Oaxaca or other decompositions on specific regional labor markets. One reason for this is data availability. Wage regressions require individual level micro-data to produce meaningful results. Nonetheless, the question that the Oaxaca decomposition is intended to address is as meaningful locally as it is nationally. In fact, it is a relatively understudied field as to whether and how the causes of discrimination, be that racial discrimination or gender discrimination, differ across regions.

This analysis used the Census Public Use Microdata Samples (PUMS), which is produced with each decennial census. It is a 1 in 20 sample of the US non-institutionalized population. That is sufficient to provide enough individual level data to implement the gender specific regressions that the Oaxaca technique requires. PUMS has 120,000 records for the Pittsburgh region and 14 million records for the United States. Wage regressions are by definition applicable only to workers; the dataset was filtered to include only full time and part time workers who reported working full year in 1999. This reduces the dataset to 50,000 records for Pittsburgh and 7 million for the United States.

The dependent variable is the natural log of a computed weekly wage rate derived from the self reported answers for weeks worked in 1999, hours worked and total wage and salary income earned in 1999. [5] The variables used for the analysis include: a set of dummy variables for 5 categories of educational attainment; synthetic "work experience" computed by subtracting from age a value determined by the level of educational attainment; a set of 27 dummy variables for industries identified at a 2 digit NAICS code level; 25 dummy variables for occupations; dummy variables for race, and Hispanic origin; dummy variables for the sector of employment, including one for Nonprofit sector employment and another for Government sector employment. The default, then, is commercial sector employment.

One advantage to the Oaxaca decomposition is that it gives more than just one single number that describes the wage gap, *It gives a specific breakdown of how much each of the characteristics in the right hand side of the wage regression contributes to the overall wage gap*. This means that the technique can not only quantify how much "statistical discrimination" there is overall but it tell specifically how much of the observed wage gap is attributable to the difference in educational attainment or for each other observed independent variables.

Results

The following table summarizes the results from these wage regressions for Pittsburgh and the nation. The table shows the overall level of the wage gap between men and women in Pittsburgh and US and then shows how much of that wage gap is attributable to each set of factors grouped in typical ways. So the results for each of the education dummy variables are grouped together to give a number that shows the percentage of the wage gap that is attributable to difference in educational attainment between men and women. Likewise the industry dummy variables are

[5] The wage regressions are in Appendix D.

grouped together as are the occupation group variables. Table 7 follows the presentation used by O'Neil (2003b, p. 313).

Table 7. Summary of Oaxaca Decomposition for Pittsburgh and U.S.

Oaxaca Decomposition Results (Using Male Coefficients)

	United States		Pittsburgh	
ΔLN(wage), i.e. the Male-Female Wage Gap	0.2724		0.3194	
Factor	Amount Explained	As % of total	Amount Explained	As % of total
Number of Own Children	0.0019	0.7%	0.0041	1.3%
Marriage Status	0.0097	3.5%	0.0148	4.6%
Educational Attainment	0.0057	2.1%	0.0152	4.8%
Experience and Experience Squared	0.0006	0.2%	0.0016	0.5%
Hispanic	-0.0019	-0.7%	0.0000	0.0%
Black	0.0027	1.0%	0.0006	0.2%
Nonprofit Sector Employment	0.0051	1.9%	0.0054	1.7%
Government Sector Employment	0.0001	0.0%	0.0002	0.1%
Industry	0.0179	6.6%	0.0538	16.8%
Occupation	0.0277	10.2%	0.0241	5.8%
Total Explained	0.0643	23.6%	0.1142	35.7%

The results show some fascinating results. First, Pittsburgh and the U.S. show similar results for several variables, including experience and, to some extent, education, both important determinants of earnings. For Pittsburgh, experience accounts for 0.5 percent of the wage gap, while experience accounts for 0.2 percent of the wage gap in the U.S., not very dissimilar results. Likewise, educational attainment shows important results for both Pittsburgh and the U.S.: 4.8 percent of the wage gap is computed to be attributable to educational attainment in Pittsburgh compared to 2.1 percent for the U.S.

The remarkable result is the big difference in the proportion wage gap attributable to industry employment patterns across gender between Pittsburgh and the U.S. For the U.S., 6.6 percent of the wage gap is attributable to industry employment patterns. In Pittsburgh, however, 16.8 percent of the wage gap is due to industry employment patterns. In fact, given that most of the other variables show similar results for the U.S. and nation, it turns out that 78 percent of the incremental wage gap in Pittsburgh is explained solely by the industry employment patterns.

These results also verify that occupation is, indeed, an important explanation of the gender wage gap. What is interesting here is that in Pittsburgh, though occupation is very important, industry

seems to have stronger effect. This relates to the discussion above, also, to women in Pittsburgh essentially "catching up" to women nationally in terms of educational attainment.

That large difference in the industry variable between Pittsburgh and the U.S. is robust enough in many ways an answer as to why there is a larger wage gap in Pittsburgh compared to the U. S. However, we needed to test this by running a few variants of the above regression. The initial model was run with a set of typical variants that are considered to measure differences in individual endowments, such as education and experience. The next decompositions were run without either of the industry or occupation sets of dummy variables. Likewise, the same decomposition was run with either the industry or occupation dummy variables individually. Table 8 summarizes these results and allows for a comparison to the initial Oaxaca results.

Table 8. Oaxaca Decomposition Results from Alternative Models Oaxaca Decomposition Results (Using Male Coefficients)

	Occupation Only				Industry Only			
	United States		Pittsburgh		United States		Pittsburgh	
ΔLN(wage)	0.2724		0.3194		0.2724		0.3194	
Factor	Amount Explained	As % of total	Amount Explained	As % of total	Amount Explained	As % of total	Amount Explained	As % of total
Number of Own Children	0.0019	0.7%	0.0041	1.3%	0.0020	0.7%	0.0044	1.4%
Marriage Status	0.010241	3.8%	0.0156	4.9%	0.0108	4.0%	0.0165	5.2%
Educational Attainment	0.0055	2.0%	0.0153	4.8%	0.0058	2.1%	0.0185	5.8%
Experience and Experience Squared	0.0006	0.2%	0.0017	0.5%	0.0006	0.2%	0.0017	0.5%
Hispanic	-0.0021	-0.8%	0.0000	0.0%	-0.0023	-0.9%	0.0000	0.0%
Black	0.0027	1.0%	0.0006	0.2%	0.0037	1.4%	0.0014	0.4%
Nonprofit Sector Employment	0.0087	3.2%	0.0141	4.4%	0.0099	3.6%	0.0090	2.8%
Government Sector Employment	0.0002	0.1%	0.0003	0.1%	0.0009	0.3%	0.0000	0.0%
Industry					0.0076	2.8%	0.0344	10.8%
Occupation	0.0332	12.2%	0.0403	12.6%				
Total Explained	0.0606	22.3%	0.0917	28.7%	0.0381	14.0%	0.0859	26.9%

These Oaxaca results confirm the importance of the industry explanation of the gender wage gap in Pittsburgh and the important difference from the U.S. as a whole. Running the decomposition with just the occupation variable shows the important and nearly identical impact of occupation on the gender wage gap in both Pittsburgh and the U.S. This implies occupation plays the same role in its effects on the gender wage gap in Pittsburgh as in the U.S. Running the decomposition with industry only, however, shows how different Pittsburgh is from the U.S. It's not that women in Pittsburgh are concentrated in low paying *occupations*, but are much more likely to be working in low paying *industries* in Pittsburgh than in the U.S.

The mere fact that the Oaxaca decomposition seems to identify some significant differences in the causes of discrimination locally versus nationally is not the answer in itself. If industry segregation and industry wage structure is the leading cause of Pittsburgh's excessive gender wage gap then it deserves further attention. The decomposition does not answer basic questions such as to how industry segregation leads to a gender wage gap. There are two competing explanations for how industry segregation could cause a gender wage gap:

1) Are women in Pittsburgh more likely to cluster in low paying industries? Or,
2) Do the industries that have proportionally more women pay substantially less in Pittsburgh than compared to the nation?

Though we do not determine which hypothesis is true for Pittsburgh, it is important to note these differences. Hypothesis #1 is essentially saying that wage structure by industry in Pittsburgh is comparable to that in the U.S. but that a gender wage gap arises because women are more segregated in low paying industries. Hypothesis #2 says that industry segregation by gender is similar in Pittsburgh compared to the nation, but that the industries that are predominantly female pay less in Pittsburgh compared to the nation.

A related question is the impact of the nonprofit sector on female earnings and the gender wage gap. From the initial Oaxaca results, we found that working in the nonprofit sector showed small and similar results in Pittsburgh and the U.S. as to its contribution to the gender wage gap, 1.7 percent and 1.9 percent respectively. However, how does the nonprofit sector dummy variable interact with the industry categories? Given that the nonprofit sector is concentrated in just a few industries, it may be that the impact of nonprofit employment is really being subsumed into the explained impact of industry segregation. To try to address this possibility, a third set of regressions were run with the nonprofit sector dummy crossed with the industry variables. In effect, the industry sectors were doubled, with individual dummy variables for each for profit industry category and a separate dummy variable for the nonprofit industry category. The goal is to test whether non-profit or default, largely commercial, industries are contributing more to the results above showing the impact of industry segregation in Pittsburgh. The results are shown in Table 9.

Table 9. Oaxaca Decomposition Results with Expanded Nonprofit Industry Categorization

Oaxaca Decomposition Results (Using Male Coefficients)

	United States		Pittsburgh	
ΔLN(wage), i.e. the Male-Female Wage Gap	0.2724		0.3194	
Factor	Amount Explained	As % of total	Amount Explained	As % of total
Number of Own Children	0.0019	0.7%	0.0041	1.3%
Marriage Status	0.0097	3.5%	0.0149	4.7%
Educational Attainment	0.0057	2.1%	0.0152	4.8%
Experience and Experience Squared	0.0006	0.2%	0.0016	0.5%
Hispanic	-0.0019	-0.7%	0.0000	0.0%
Black	0.0027	1.0%	0.0006	0.2%
Occupation	0.0224	8.2%	0.0184	5.7%
Government Sector Employment	-0.0001	0.0%	0.0003	0.1%
Non Profit Industries	0.0173	6.3%	0.0340	10.7%
All Other Industries	0.0062	2.3%	0.0263	8.2%
Total Explained	0.0645	23.7%	0.1155	36.2%

The results here are interesting and mixed. For both nonprofit and the all other industries category, there is substantially higher gender wage inequality explained by industry variables in Pittsburgh than for the U.S. Both are important in understanding the impact of industry on the gender wage gap in Pittsburgh, as distinct as and more important than in the U.S. The difference is larger in the default industry category (8.2 percent for Pittsburgh compared to 2.3 percent in the U.S.) than the difference for the nonprofit industries (10.7 percent in Pittsburgh compared to 6.3 percent in the U.S.). However, it is fair to say that neither set of industry variables is solely responsible for the incremental explanation of industry segregation in the Pittsburgh results, but both appear to be an important explanation. Interestingly, the difference between the nonprofit industry category and the default industry category is much larger in the case of the U.S. Here, it appears that by decomposing the industry effect, nonprofit industries play a stronger industry role on the gender wage gap nationally than do the default industry category. Thus the nonprofit industry's relative effect on earnings inequality is more important relative to the default industry category in the nation as a whole than in Pittsburgh. In Pittsburgh, however, the absolute contribution of the nonprofit industries is higher than in the U.S.

Conclusions and Recommendations

This report analyzed the gender wage gap in Pittsburgh and possible explanations for this disparity in earnings between women and men in the metropolitan area. The major changes in the role of women in the Pittsburgh regional economy occurred during a period of major economic restructuring of the regional economy. Economic restructuring in an older industrial region, such as Pittsburgh, changed both where people worked and who worked.

The first major change in the Pittsburgh region is the rise in labor force participation rates of women. Historically, women in Pittsburgh had lower labor force participation rates than women nationally and women in urban areas. Today, participation rates have increased to mirror national averages.

Another major change that resulted from the increase in women's labor force participation rates is that women today make up nearly half the region's workforce.

And third, women in Pittsburgh have increased their educational attainment over this period of restructuring. Today, women in Pittsburgh have caught up with men educational attainment, and, for the younger age cohort, exceeded educational attainment of men.

Despite these advances, women in Pittsburgh receive lower earnings, on average, than men and fare worse compared to Pittsburgh men than women compared to men nationally.

We conclude that the *legacy effect* of the region's industrial structure remains one of the main reasons women have not caught up in earnings. The wage gap persists, in part, by industry employment patterns. In other words, after accounting for individual characteristics of female workers and their occupations, they are in industries that pay less. This is different from women nationally, on average. The pattern of industry wages in Pittsburgh accounts for a large part of the difference in the wage gap. Either women in Pittsburgh are concentrated in industries that are underpaid in Pittsburgh compared to the rest of the nation or the relatively higher paying industries in Pittsburgh have yet to hire women in proportion to national averages. Pittsburgh women might be said to suffer from "industrial segregation," since the impact of occupational segregation and education and experience follow national effects.

This work also supports the view that economic restructuring does not necessarily reduce gender wage disparities. The loss of over 150,000 higher paid manufacturing jobs coupled with an increase in skills and educational attainment of women has not resulted in relatively lower wage disparities between men and women in the region, especially for women with higher levels of education. Disparities may, however, have been reduced for workers with less education, as a result in declining real earnings of men. More work is needed here to compare changes over time and discern trends.

This work is important because it highlights how far women have come in the Pittsburgh regional economy over the past decades and raises the issue of how far women need to go to reach a level of equality parallel to other places in the U.S. and to the U.S. as a whole. For

instance, Pittsburgh women's share of production and science occupations compared to men in the region is far less than women's share nationally.

Since gender wage disparities are lower in faster growing regions, any policies to bolster Pittsburgh's regional economy and growth should benefit women as well as men.

Women need to be supported throughout their careers. The barriers here do not seem to be entry level barriers, as women have achieved equality with men. Some of the examples highlighted in the report show that women in higher paying occupations, such as management, earn less than men and, compared to women nationally, fare even worse.

Major organizations with significant management positions might be encouraged to examine their percentage of women in management and equity pay issues across gender. Furthermore, without an increase in the relation of Pittsburgh women in management's earnings to both men in the region and women nationally suggest that without major changes, attraction and retention of top female managers will become more difficult. Promotion and mentoring policies for senior and professional women in all industrial sectors should be reviewed in order to foster greater equity.

Manufacturing firms and other industries with relatively high gender disparities might reduce their barriers to employing more women and evaluate their pay and hiring procedures.

Further research into gender wage disparities can focus on the role of unions. Preliminary work suggests that higher levels of male private sector unionization may be related to larger wage gaps. In the nation as a whole, labor union density is associated with a smaller gender wage gap. Certainly in Pittsburgh, as union rates have fallen, it would be interesting to see how the gender wage gap has changed over time and if there is any relation between these. Local labor unions might strengthen their efforts to organize women in all sectors and to promote the status of women during collective bargaining.

Additional work is also needed to assess the impact of nonprofit organizations on the gender wage gap. Preliminary work here suggests that it is important in Pittsburgh and the U.S. but may play a relatively larger role nationally on the gender wage gap. Again, the region's legacy effect may make Pittsburgh different from the national average. Decomposing causes across the top 100 metropolitan areas could also lend further evidence on these issues. Nonetheless, the differences in the nonprofit sector compared to others shown here suggest that more equitable hiring, retention, and promotion practices would promote greater equity.

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Appendix A: Data Sources

This report uses multiple secondary data sets to understand and analyze the gender wage gap in the Pittsburgh region. These include:

1. U.S. Bureau of the Census (Census). This includes 1990 and 2000 demographic and economic data used primarily to compare 100 largest metropolitan regions. Historical data
2. Public Use Microdata Samples (PUMS). These are files of samples of households, with information about the individual residents in those units. PUMS records are at 1% and 5% samples. This study uses the 5% microdata to analyze income and related attributes of individuals by a series of indicators.
3. Current Population Survey (CPS).
4. Regional Economic Information System (REIS). REIS is the regional data system of the Bureau of Economic Analysis in the U.S. Department of Commerce.

Appendix B: Occupation and Segregation Indexes

Occupation Segregation Index, Top 100 MSAs

Rank	MSA/CMSA	Index
1	San Francisco--Oakland--San Jose, CA CMSA	20.1%
2	Boston--Worcester--Lawrence, MA--NH--ME--CT CMSA	22.3%
3	Washington--Baltimore, DC--MD--VA--WV CMSA	22.4%
4	New York--Northern New Jersey--Long Island, NY--NJ	22.4%
5	Austin--San Marcos, TX MSA	22.6%
6	Madison, WI MSA	22.6%
7	Raleigh--Durham--Chapel Hill, NC MSA	22.7%
8	San Diego, CA MSA	23.4%
9	Honolulu, HI MSA	24.4%
10	Columbus, OH MSA	24.7%
11	Hartford, CT MSA	25.3%
12	Los Angeles--Riverside--Orange County, CA CMSA	25.3%
13	Denver--Boulder--Greeley, CO CMSA	25.4%
14	West Palm Beach--Boca Raton, FL MSA	25.6%
15	Minneapolis--St. Paul, MN--WI MSA	25.6%
16	Orlando, FL MSA	25.6%
17	Albuquerque, NM MSA	25.7%
18	Philadelphia--Wilmington--Atlantic City, PA--NJ--D	26.0%
19	Sacramento--Yolo, CA CMSA	26.0%
20	Seattle--Tacoma--Bremerton, WA CMSA	26.1%
21	Colorado Springs, CO MSA	26.3%
22	Miami--Fort Lauderdale, FL CMSA	26.3%
23	Rochester, NY MSA	26.3%
24	Providence--Fall River--Warwick, RI--MA MSA	26.3%
25	Atlanta, GA MSA	26.5%
26	Chicago--Gary--Kenosha, IL--IN--WI CMSA	26.7%
27	Tampa--St. Petersburg--Clearwater, FL MSA	26.7%
28	Tucson, AZ MSA	26.8%
29	Albany--Schenectady--Troy, NY MSA	26.9%
30	Lexington, KY MSA	26.9%
31	Columbia, SC MSA	27.2%
32	Richmond--Petersburg, VA MSA	27.2%
33	Dallas--Fort Worth, TX CMSA	27.2%
34	Salt Lake City--Ogden, UT MSA	27.3%
35	Melbourne--Titusville--Palm Bay, FL MSA	27.5%
36	El Paso, TX MSA	27.6%
37	Boise City, ID MSA	27.6%
38	Kansas City, MO--KS MSA	27.7%
39	Phoenix--Mesa, AZ MSA	27.8%
40	Omaha, NE--IA MSA	27.9%
41	Jackson, MS MSA	28.0%

42	Charlotte--Gastonia--Rock Hill, NC--SC MSA	28.6%
43	Des Moines, IA MSA	28.9%
44	Nashville, TN MSA	28.9%
45	Sarasota--Bradenton, FL MSA	28.9%
46	Syracuse, NY MSA	29.1%
47	Dayton--Springfield, OH MSA	29.2%
48	Greensboro--Winston-Salem--High Point, NC MSA	29.2%
49	Spokane, WA MSA	29.2%
50	Knoxville, TN MSA	29.3%
51	Indianapolis, IN MSA	29.4%
52	Springfield, MA MSA	29.4%
53	Lansing--East Lansing, MI MSA	29.4%
54	Portland--Salem, OR--WA CMSA	29.5%
55	San Antonio, TX MSA	29.5%
56	Milwaukee--Racine, WI CMSA	29.5%
57	Cincinnati--Hamilton, OH--KY--IN CMSA	29.5%
58	Memphis, TN--AR--MS MSA	29.7%
59	Buffalo--Niagara Falls, NY MSA	29.8%
60	St. Louis, MO--IL MSA	29.8%
61	Las Vegas, NV--AZ MSA	30.0%
62	Cleveland--Akron, OH CMSA	30.0%
63	Kalamazoo--Battle Creek, MI MSA	30.0%
64	Grand Rapids--Muskegon--Holland, MI MSA	30.0%
65	Little Rock--North Little Rock, AR MSA	30.2%
66	Jacksonville, FL MSA	30.3%
67	Detroit--Ann Arbor--Flint, MI CMSA	30.3%
68	Harrisburg--Lebanon--Carlisle, PA MSA	30.7%
69	Oklahoma City, OK MSA	30.7%
70	Greenville--Spartanburg--Anderson, SC MSA	30.8%
71	Allentown--Bethlehem--Easton, PA MSA	30.8%
72	Chattanooga, TN--GA MSA	31.1%
73	Norfolk--Virginia Beach--Newport News, VA--NC MSA	31.1%
74	Pittsburgh, PA MSA	31.3%
75	Daytona Beach, FL MSA	31.4%
76	Houston--Galveston--Brazoria, TX CMSA	31.9%
77	Charleston--North Charleston, SC MSA	32.1%
78	Fort Wayne, IN MSA	32.1%
79	Fort Myers--Cape Coral, FL MSA	32.2%
80	Birmingham, AL MSA	32.3%
81	New Orleans, LA MSA	32.3%
82	Louisville, KY--IN MSA	32.3%
83	Wichita, KS MSA	32.6%
84	Augusta--Aiken, GA--SC MSA	33.1%
85	Tulsa, OK MSA	33.2%
86	Scranton--Wilkes-Barre--Hazleton, PA MSA	33.7%
87	Lancaster, PA MSA	33.7%
88	Toledo, OH MSA	34.1%
89	Pensacola, FL MSA	34.2%
90	Canton--Massillon, OH MSA	35.3%

91	Fresno, CA MSA	35.4%
92	McAllen--Edinburg--Mission, TX MSA	35.4%
93	Baton Rouge, LA MSA	35.4%
94	Bakersfield, CA MSA	36.0%
95	Saginaw--Bay City--Midland, MI MSA	36.1%
96	Johnson City--Kingsport--Bristol, TN--VA MSA	36.2%
97	Stockton--Lodi, CA MSA	37.1%
98	Modesto, CA MSA	37.6%
99	Lakeland--Winter Haven, FL MSA	38.1%
100	Mobile, AL MSA	38.7%

Industry Segregation Index, Top 100 MSAs

Rank	MSA/CMSA	Index
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36	Seattle--Tacoma--Bremerton, WA CMSA	27.5%

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