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ABSTRACT

In the past two decades gender pay differences have narrowed considerably and a declining significance of gender has pervaded the labor market in numerous ways. This paper contends that in the first several decades of the twentieth century there was a rising significance of gender. The emergence of gender distinctions accompanied several important changes in the economy including the rise of white-collar work for women and increases in women's educational attainment. Firms adopted policies not to hire women in particular occupations and to exclude men from other occupations. A model of discrimination is developed in which men oppose the hiring of women into certain positions. The assumptions of the model break down when women acquire known and verifiable credentials. The shift from the rising to the declining significance of gender may have involved such a change.

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Women now constitute almost half of the United States labor force. About 80 percent of women 25 to 44 years old work for pay and 85 to 90 percent of female college graduates do. Looking across the full twentieth century the gender gap in labor force participation has largely closed (Figure 1) and the gap in earnings has narrowed considerably, especially in the last twenty years (Figure 2). During the past hundred years one might conclude that there has been a declining significance of gender in the labor market.

But before there was a declining significance of gender, there was a *rising significance of gender*. Gender became a truly significant factor in the labor market in the first few decades of the twentieth century. Ironically, gender differences emerged during 1900 to 1930 when young women were remaining employed after marriage and when the fraction of employed women who were white-collar workers increased from 17.8 percent to 44.2 percent, considerably more than from 1930 to 1960.¹

The notion that gender became significant in the labor market in the early twentieth century might well be greeted with some skepticism. Gender, many will rightly claim, has always mattered in the labor market and the sexual division of labor is ancient. But I will try to convince you that gender distinctions in work, jobs, and promotion were extended and solidified in the early twentieth century and these changes became long-lived. These gender distinctions emanated from the treatment of individuals as members of a group, rather than as separate individuals.

The early twentieth century could have been an important positive turning point in gender distinctions in the labor market, education, training, and even the home. But it was not. I am not claiming that miraculous equality could have appeared in the 1920s. What I will claim is that the

¹ The fraction of women who were white-collar workers in 1960 was 0.563. The percentage point increase from 1900 to 1930 is about the same as it was from 1930 to 2000, when the fraction was about 0.73.

history of women in the labor market could have been sufficiently different to hasten the advances of the past three decades by perhaps twenty years. I conclude this essay with some reflections on the period of the declining significance of gender, but my main concern here is with its rising significance.

Labor Force Participation Rates

The rising significance of gender was accompanied by an increased labor force participation of young, married women. This increase may seem odd and paradoxical, but it is important part of the story.

Consider the two lines in Figure 3 giving the labor force participation rates of younger married women (25 to 34 years old) and older married women (45 to 54 years old). The graph covers the last hundred years and the two lines crisscross several times across the century, looking oddly like a double helix.

Labor force rates for both groups began rather low, a point to which I will return in a moment. The lines then diverge. The rate for younger women increased far more than that for the older women. But around 1950 the lines cross. The labor force rate for the older women greatly increased in the 1940s and 1950s, whereas the increase for the younger women was less steep. By the 1960s the labor force participation rate for the older group was substantially higher than for the younger. But in the 1970s and early 1980s the younger group greatly increased its participation rates, and the two lines cross once again. By the end of the century the lines have come together, as they had been at the start of the century but at a considerably higher level.

That is all very interesting. But what does it have to do with the increasing significance of gender? The increased participation of the younger group in the first few decades of the

century was, I will contend, a historic opportunity that could have provided an opening wedge. The greatly increased participation among the older group of women in the 1940s and 1950s was comprised, in large measure, of women who in the 1920s had earlier expanded their participation. A 20-year old in 1920 was a 40-year old in 1940 and a 50-year old in 1950. That is, the younger group of women not only entered the labor force in growing numbers in the 1920s and 1930s, but also expanded their participation when they were older.²

Although Figure 3 shows only the participation rate of married women, the rate for young single women (who were not currently attending school) also increased in the 1920s.³ Although the vast majority of unmarried, employed women in the 1920s and 1930s dropped out of the labor force at the time of their marriage, the minority who were employed after marriage remained in the labor force for a considerable number of years. The female labor force, in other words, was rather “heterogeneous.”⁴

Women who remained in the labor force after marriage, even those who were employed for long durations, did not advance greatly in their jobs. Part of the reason might be due to the inability of employers to distinguish, at the point of hire, between women who would remain

² Many of these young women were unmarried when they first entered the labor force and are not in Figure 2. This point will be clearer in a moment.

³ I exclude individuals in school because the fraction who were attending school greatly increased during the period considered. The labor force participation rate of young women actually decreased, but the increase in those attending school more than offset it. The rate for 15 to 24 year old (white) single women decreased from 0.466 in 1920 to 0.426 in 1930. But the schooling rate for this age group increased from 0.316 in 1920 to 0.493 in 1930 and thus the rate excluding those at school increased from 0.682 to 0.841. *Sources:* Labor force data from Goldin (1990); schooling data from Goldin (1994) and U.S. Department of Education (1993); population data from U.S. Bureau of the Census (1975).

⁴ See Goldin (1989) and Heckman and Willis (1977) on “heterogeneous” female labor force participation. Goldin (1989) shows that the female labor force was relatively heterogeneous in the 1920s to 1950s, and Heckman and Willis (1977) demonstrate that heterogeneity continued into the 1970s. If the labor force is heterogeneous and the participation rate is 20 percent, then 20 percent of the women are in the labor force all year and 80 percent are not in at all. Furthermore, those women who are in the labor force remain in for long periods and are joined by others, when the participation rate rises, who were not in the labor force recently. In contrast, a homogeneous female labor force is one for which all women are in the labor force for the same number of weeks per year and, as the participation rate rises, each increases the number of weeks she works. Complete heterogeneity and complete homogeneity are extremes of a spectrum.

employed after marriage and those who would not. Not being able to make this distinction, employers offered women “short ladder” or dead-end jobs. Even college graduate women found the labor market to be hostile. Young women in the 1950s and 1960s were aware of the problems their predecessors encountered in the labor market during previous decades. Discouraged about their prospects, many had large families and remained at home.⁵

Another revealing way of viewing labor force participation is to array the rates by birth cohort and graph them by age (as opposed to arraying them by age and graphing by year as in Figure 3). Labor force participation rates arranged in this manner, by age and by cohort, are given in Figure 4, for (white) married women. They are given in Figure 5 for all college graduate women independent of marital status.

Figure 4 gives labor force participation rates by age for “synthetic” cohorts of married women born from 1866-75 to 1976-80. These are synthetic, not actual, cohorts because they connect data across various census (or Current Population Survey) years by the birth year of the individuals and are not constructed from longitudinal data. These particular synthetic cohorts are for currently married women. That is, a woman who marries at age 21 and remains married until age 65 will be correctly represented in these graphs. But a woman who marries at age 32, divorces at age 45, and then remarries at age 51 will not be as accurately represented. She will enter the population at age 32, leave at age 45, and reenter at age 51. Some individuals are better depicted than are others. Despite that caveat, these graphs reveal an enormous amount about the synthetic and actual cohorts. Most important is that almost all cohorts of U.S. women had increased labor force participation rates as they aged (within their married years).

The graph for college graduate women (Figure 5) was constructed in a different manner

⁵ Another possibility is that the baby boom intervened, leading young mothers to remain at home; see Easterlin (1980), for example, on the topic. My point here is that some portion of the fertility increase may have been endogenous to the types of work offered women.

from that for all education groups (Figure 4). The former is for all marital statuses whereas the latter is only for married women. The caveat just mentioned about the synthetic cohorts does not apply to Figure 5, although a different consideration is relevant. The composition by marital status in Figure 5 changes as the cohort ages and, in consequence, participation rates decrease for the younger group many of whom married, had children, and left the labor force at least for a time.⁶ Participation rates later increase with age, in a fashion similar to the data in Figure 4 for married women across all educational groups. The participation rate levels are higher in Figure 4 than in Figure 3, as would be expected since the college group has a higher market wage.

The meaning of these cohort labor force participation rates for the significance of gender in labor markets will be established in a moment. My more immediate point is simply that participation rates began to increase among young married women in the 1920s and 1930s. That observation leads me back to a clarification I earlier promised.

I noted before that the labor force participation rates of married (white) women were rather low early in the twentieth century. These rates are so low that they would appear to be in error. They imply that married women contributed hardly at all to family income, even though family incomes, for many, were quite meager.

One possibility is that the census question, which in the pre-1940 period asked “occupation” rather than employment, did not encourage women to state that they had worked for pay during some part of the year. Although that may have been the case, I believe that the reason for low participation rates is that these rates reflect “market” work, by which I mean paid employment “outside the home.”

Before the mid-twentieth century, married women often worked for pay within their

⁶ Another caveat is that cohorts increase in education as they age either because they actually gain more education or there is educational “creep” or “inflation.”

home or within the homes of friends or relatives. They worked at industrial homework, as laundresses, seamstresses, and so on. They also worked in family businesses and as boarding housekeepers in cities, and they worked on family farms. I have constructed estimates of “shortfalls” to the census data, and these shortfalls are substantial for the early decades of the twentieth century. But the shortfalls are mainly from work that was not directly remunerated (e.g., from family businesses and family farms) and from work that did not take women out of their homes. The census data, while deficient in some respects, still provide a good measure of the labor force participation of women outside their homes in the paid market.

Thus, the increase in married women’s labor force participation in the early decades of the twentieth century constituted a real change in their lives. Previous cohorts of married women may have labored in a manner “hidden” from the purview of the census takers. But they did not work at jobs that greatly expanded their social networks and they were not employed in firms that could have changed their lives by offering them job advancement.

Two Related Changes in the Early Twentieth Century

To understand the origins of the rising significance of gender I must recount two related changes of the early twentieth century. The first is the “high school movement.”⁷ The second is the emergence of ordinary “white collar” work through the rise of the clerical, sales, and managerial sectors. Both changes were truly spectacular and I am not exaggerating.

The High School Movement

The increase in high school attendance and graduation in the first few decades of the twentieth century created mass secondary schooling in America. Prior to 1900 secondary

⁷ By the “high school movement” is meant the rapid increase in enrollment and graduation from the nation’s secondary schools from around 1910 to 1940. See Goldin (1998).

schooling was often directed at youths who were being prepared for college entrance exams. A substantial fraction of high school graduates even as late as 1910 continued with some form of post-secondary school training.

But around 1900 U.S. secondary schooling began a transformation that made it more useful for those entering work immediately after leaving high school. These changes were wide ranging and affected the high school curriculum. Language courses, for example, shifted from the “dead” tongues of Latin and Greek to the more immediately useful German and French. Bookkeeping, accounting, and various other commercial courses were added. In most cases, these changes made high school more relevant to youths who would not otherwise have attended, and thus served to increase their attendance and graduation rates. In other instances, however, these changes led children to be tracked into programs that prevented them from continuing with their education after high school. This is not the place to discuss the merits and demerits of early twentieth century educational reforms. The important point here is simply that the high school graduation rate of young people soared in the early twentieth century.

Less than 10 percent of all eighteen year olds graduated high school in 1910 but 35 percent did, outside the South, by 1930. Attendance and graduation rates were higher for girls than they were for boys, and they were higher for girls in every U.S. state before the Great Depression. The greater level of secondary school education for girls than for boys was sustained until unemployment rates soared in the 1930s and teenage boys, who had previously worked in manufacturing and other sectors, were thrown out of work. But even though enrollment and graduation rates by sex narrowed in the 1930s, girls still went to school in greater numbers than boys.

The pull of manufacturing jobs for teenage boys, particularly those living in the industrial

cities of the northeast and Midwest, was not the only reason for the difference in high school attendance and graduation rates by sex. Although the return to a year of high school was probably greater for a young woman than for a young man in the industrial northeast, there was another reason for the higher enrollment and graduation rates of girls.⁸ A high school degree, and high school courses, gave a young woman the ability to be hired into a white-collar job. Ordinary white-collar jobs, such as office positions, were “nice,” clean and respectable. They also paid relatively well and had shorter hours. It should not be surprising that they were much preferred to manufacturing jobs, even when the two paid the same per week.

The “New Economy” of the Early Twentieth Century

The educational changes I summarized under the heading of the “high school movement” were not necessarily exogenous. In the decades preceding these changes, parts of the U.S. economy began a grand transformation. Firms in manufacturing and in retail trade became considerably larger, and the communications and public utilities sectors expanded significantly. In consequence, more managerial and clerical workers were demanded. Secretaries, stenographers, bookkeepers, and clerks of all types were in great demand.

In the 1890s these office positions were still the “Dickensian,” black-coated variety. Secretaries were the “guardians of the firm’s secrets.” Bookkeepers wore green shades and added long columns of numbers in their heads. The higher paid clerks had worked their way up from lowly office positions. Most of the office workers would have begun their employment with a belief that hard work, long tenure with the firm, and a pinch of good luck would get them a better position.

More relevant here is that, in 1890, most of these office workers were men. The

⁸ Goldin and Katz (2000) use the 1915 Iowa State Census to estimate the pecuniary return to a year of high school in 1914 Iowa. Because Iowa did not have abundant manufacturing jobs returns were fairly similar by sex, but the same was probably not the case for the industrial parts of America.

secretary was not just a pretty face but, rather, the trusted employee of the company president often in a direct line for his position. The bookkeeper was the company's accountant, not a "girl" working at a bookkeeping machine. Even the stenographer was often a man.

An aspect of these jobs that links educational and economic change is that most office jobs required a level of literacy and numeracy that could be achieved in secondary school. By the early twentieth century, the majority of firms hiring in these positions required some years of high school. By the 1930s the vast majority required a high school diploma.

The increase in high school education during the early 1900s was, in large part, caused by the increased demand for high school educated workers. But greater schooling must also have had an independent effect. The "high school movement" involved an enormous increase in public expenditures on education; schools were built and teachers were hired. Some youth were enticed to go to school by their greater proximity. The majority of youth (or their parents), however, increased their demand for schooling to gain from the greater rewards in the "new" economy.

The Office and the "New Woman"

The office jobs that initially expanded in number were of the skilled type—the "Dickensian" black-frocked clerks, the old-fashioned secretaries, and the green-shaded bookkeepers. Some of these positions were considered skilled because they were part of a job ladder within the firm. Ordinary clerks and secretaries and, possibly, even some stenographers and typists expected to be promoted one day. These jobs were soon replaced by newer positions that were not part of an internal job ladder.

Many of the new jobs were created by the mechanization of the office. Mechanization in

the office began with the typewriter, later the calculator and comptometer (a form of adding machine). Duplicating, addressing, and billing machines, stenographic recorders, and filing systems rapidly followed. Advertisements for office machinery filled business magazines in the 1920s. With electrification the “industrial revolution of the office” was in full swing.

The early twentieth century mechanization of the office was the white-collar counterpart of the industrial revolution in manufacturing that had swept America a century before. It had similar effects. New work organization and machinery led to an intricate division of labor. Secretaries no longer kept the secrets of the office. Rather, they took dictation and typed letters. In some offices there were separate typists and stenographers. In large offices, such as those of the huge mail-order catalogue firms and the insurance companies, typists were assigned to different pools of varying skill and were paid commensurately with the group’s typing speed and precision.

Similar changes occurred in other sectors of the economy. Retail stores, for example, greatly increased in size with the creation of department store chains. Owner-operators of small stores had manned the cash drawer, ordered the goods, took inventory, and stocked the shelves. But with increased scale, workers were hired to do separate tasks. Saleswomen and salesmen sold the goods, order-clerks placed the orders, stock-clerks handled inventory, and so on.

The growth of ordinary white-collar jobs, in both the office and retail stores, and the increase of women in these positions, led to an enormous shift in the occupational composition of working women between 1900 and 1930. In 1900 17.8 percent of all employed women (14 years and older) were white-collar workers in the professional, managerial, clerical, and sales categories, and 8.3 percent of the total were in the clerical and sales groups. But in 1930 44.2 percent of all employment women were in white-collar occupations and 27.7 percent were in the

clerical and sales group—more than three times the fraction in 1900. The increase in white-collar employment in the subsequent three decades, from 1930 to 1960, was only 12 percentage points or less than half the increase in the previous three decades. (The occupational distribution data are provided in Table 1 for 1900 to 1970 and for men and women separately.)

Major ground for women's occupations was broken in the early twentieth century long before the immediate post-World War II years often credited with its change. One large difference between the two 30-year periods, 1900 to 1930 and 1930 to 1960, is that the aggregate female labor force participation rate did not increase by much from 1900 to 1930, whereas it increased substantially from 1930 to 1960.

Even though male workers also increased their employment in these occupational groups the increase, as a fraction of the labor force, was far greater for women. About the same percentage of men and women were white-collar workers in 1900. But, for men, it increased from 17.6 percent to 25.2 percent, or one-third the increase for women. For clerical and sales workers it increased from 7.4 to 11.6 percent, or one-fifth the increase for women. Put another way, women were 18.5 percent of all white-collar workers in 1900 but were 33.2 percent in 1930. Whereas women were 20.2 percent of all clerical and sales personnel in 1900, they were 40.4 percent in 1930. However you express the data, the increase in white-collar and clerical work for women from 1900 to 1930 was truly spectacular.

By the 1920s workingwomen were no longer just domestic servants, manufacturing operatives, and piece-rate workers in factories and homes. They were white-collar workers and comprised almost half of all clerical and sales personnel. Young women, fresh out of high school, commercial institutes, and colleges and universities flocked to the new office jobs. More important for the discussion here is that they increasingly remained employed after marriage.

In the early twentieth century the norm for workingwomen had been to leave paid work at the time of marriage, if not a bit before. But in the 1920s a new norm was forged. Women who had white-collar jobs did not necessarily quit work directly with marriage. Rather, some remained employed often until they decided to have a first child. The old norm had been formed when most jobs that women occupied were physically arduous, dirty, and not always respectable. The white-collar jobs of the office, in contrast, were clean, ladylike positions that used the mind more and muscle less. Husbands, families, and society, in general, rapidly discarded the old norm that a working wife brought shame to her family.

One complication is that “marriage bars”—policies that prohibited the hiring of married women and led to the dismissal of single women who married while employed—had been erected by many school districts ever since the late nineteenth century. By the early twentieth century marriage bars began to appear in certain offices. The Great Depression accelerated the spread of marriage bars, introduced ostensibly to give work to the “breadwinners.”⁹ The economic downturn and these firm policies were major setbacks to the employment of married women. Yet the participation of married women continued to increase during the 1930s.

The 1920s was a time of social change in the lives of young women and the decade was aptly termed the era of the “new woman.” The age at first marriage, which had increased before the 1920s, was high, and the birth rate, which had begun its decline long before the 1920s, was low. The vote had been won; skirts were short and hairdos were as well. Much of the great American literature of the day reflected these changes and various authors, Sinclair Lewis and Theodore Dreiser among them, saw the potential for progress as well as the barriers to it. An example from the work of Sinclair Lewis, who was awarded the Nobel Prize in literature in 1930, will make my point.

⁹ See Goldin (1991) on marriage bars before and during the Great Depression.

The Job (1917) was the first novel in Sinclair Lewis's feminist trilogy.¹⁰ The protagonist, Una Golden, is a young, cracker-jack stenographer in New York City who "could not imagine any future for ... women in business." "The comfortable average men of the office," she observed with envy, "if they were but faithful and lived long enough, had opportunities, responsibility, forced upon them." Una eventually becomes a wealthy businesswoman and marries a loving husband who admires her business acumen. But she is not content and muses: "I will keep my job ... But just the same ... I want Walter, and I want his child." My point is not that a great American novelist wrote a modern story about career and family conflicts, but that there were many stories and novels in the 1920s about independently minded, career women who had white-collar jobs.

"Brawn" and "Brain" Jobs

To understand the actual and potential role of the new office jobs, it will help to divide occupations into "brawn" and "brain" jobs, even though most, even today, require a bit of both. For the early part of the twentieth century, however, this simplifying assumption makes good sense. Production jobs in manufacturing, as well as those in construction and agriculture, were mainly of the "brawn" type. Office positions, however, required little brawn, but demanded thinking, literacy, numerical skill, and the like. They were "brain" jobs.

Many of the manufacturing positions that had substantial brawn requirements were limited to men, de facto. Entire industries existed in the late nineteenth and early twentieth centuries in which women were not to be found in hardly any production positions. Iron and steel in 1890, for example, employed 147,357 male production (craft and operative) workers but just two females across the entire United States. In that year, foundry and machine shops

¹⁰ *Main Street* (1920), the best known of the trilogy, was second, and *Ann Vickers* (1933) was last.

employed 205,530 male but only 1,040 female production workers. Similar sex compositions existed in agricultural implements, carriages, cooperage, flouring and gristmill products, leather, liquors, lumber, timber products, and all of the building and construction trades. In fact, there were 23 industries (including the construction trades) in which men were at least 94 percent of all production workers across the entire United States. These industries accounted for 54 percent of all adult male production workers across all manufacturing employments.¹¹

In some industries the brawn requirements that led to the virtual exclusion of female workers were actually vestigial and existed, often through union rules, to protect jobs for male workers. The strength needed to perform the job could have been circumvented by the use of machinery and, in fact, was eliminated during the national crisis of World War I, and again during World War II, when changes were made to factories that enabled the employment of women. In some factories machinery was added to render the work less physically demanding, whereas in others, work was divided so that the hauling and other physically demanding tasks were given to men. Examples in World War I are car and truck factories, foundries and machine tool shops. In World War II, the list is longer and includes aircraft, ammunition, gun, and tank production.¹²

Manufacturing firms occasionally hired women as replacement workers during strikes and they also hired women, contrary to union demands, to perform some of the lighter tasks in production. In the early 1900s, for example, a foundry union protested that the task of making small cores, which had lower strength requirements, was offered to women. The task, it was claimed, was an integral part of an apprenticeship system in which male workers trained in the easier tasks, for example in the small cores, were then able to advance to the more arduous and

¹¹ U.S. Census Office (1895) and Goldin (1990, table 3.4).

¹² On the use of machinery during World War I, see New York State, Department of Labor (1919).

skilled ones, for example to the larger cores. In a similar case involving slaughterhouses, there was no comparable claim and women were simply barred from the industry, possibly because it was feared they would lower wages or for other reasons.¹³

Earnings Functions in “Brawn” and “Brain” Jobs in Theory and in Fact

Earnings Functions in Theory

A related aspect of the brawn and brain sectors concerns the earnings of workers over their employment histories. Consider the earnings of male workers in each of the two sectors, as diagrammed in Figures 6a and 6b.

The brawn sector worker’s wage at the beginning of his work experience is given by M_0 in Figure 6a and his wage does not increase much with time on the job.¹⁴ Consider instead a male worker in the brain sector (Figure 6b). He has a greater level of formal education than his brawn counterpart and, in consequence, earns more at the beginning of his job tenure and his earnings increase substantially with time on the job. The brain worker has greater slope to his earnings profile because he garners human capital and is advanced to more demanding positions. That is, the brain worker climbs an “internal ladder,” whereas the brawn worker does not or, when he does, the ladder is shorter.

Now consider adding women to both of these sectors. Women are at a considerable disadvantage in the brawn sector and begin with wages that are far below those of men. In Figure 6a, for example, they begin at F_0 . The disadvantage of women in the brawn sector comes about primarily because most women are not as strong as are most men. That is not to say that

¹³ See Goldin (1990, p. 104) on entry barriers to women in foundries and slaughterhouses. For one possible reason for these entry barriers, see the “pollution theory” section below.

¹⁴ “Experience” here can be thought of as total work experience, although I will later distinguish among total work experience, occupation experience, and tenure with a firm.

the distribution of brawn by sex does not overlap, for it does. But the averages of the two distributions differ and much is non-overlapping. Women have lower beginning wages, and even though their productivity increases with time on the job, their wages rise at the same rate as those of men whose initial wages are far higher. Thus, in Figure 6a, a male worker at the start of his employment earns more than does a female worker, and he earns even more than a female worker with considerable job experience. But neither the male nor the female wage increases as much with time on the job as in the brain sector.

The brain sector should have evened out some aspects of the playing field between men and women in the labor market. Women obtained schooling of the same type as did men through attending public secondary schools, private business colleges, and regular colleges and universities.

In some sense, the brain sector did even the playing field. The initial wages of men and women were far closer in the brain sector than they were in the brawn sector. But “time on the job” did not yield the same return to women as it did to men. No level of work experience—with the firm or in all office work—led to much earnings growth for women, whereas it did for men. What this means is that the ratio of male to female earnings in the brain sector increased with greater levels of work experience. Rather staying relatively constant, as it did in brawn jobs, the ratio rose. In terms of a concept in labor economics, “wage discrimination” was actually *larger* in brain jobs than it was in the brawn jobs.

By “wage discrimination” is meant that part of the difference in wages by sex that is *not* explained by differences in observables, such as work experience, education, and training. Rather, the wage difference is explained by a disparity by sex in the returns to these variables. Even if a man and a woman had the same levels of experience, education, and training, they

would still have different wages because the return to each of the observables is different.

Another possibility is that the constant term in the two equations is different. In the schematic representation of Figure 6a, all “wage discrimination” is due to differences in initial earnings, that is, in the earnings of men and women at the start of their employment. In the case of jobs that only differ on the basis of strength requirements, the initial earnings difference would be primarily, but not entirely, due to differences in physical ability.

Earnings Functions in Fact: Brawn Jobs

Figures 6a and 6b are schematic representations of longitudinal earnings patterns of men and women in the brain and brawn sectors. Longitudinal earnings data, however, are not available for early twentieth century manufacturing workers. Rather, cross-section earnings data do exist with many of the important covariates. For office workers both retrospective and cross-section data exist for 1940, and I will discuss only the cross-section earnings data results.

The Figure 6a representation, while schematic, is close to being correct. Table 2 reports the results from a survey of male and female workers in 1892 working primarily in manufacturing. Earnings functions for female manufacturing workers in the early 1900s give similar results.¹⁵ The slopes of the earnings functions for men and women are not as parallel as depicted in Figure 6a, but within the relevant range they are very nearly so.

In the survey that produced these data, workers were asked when they began paid employment, how many years they worked in their current occupation, and the number of years they were with their current employer. Thus work experience is measured three ways: total experience, years in an occupation, and years with a firm (usually called “tenure”). If an

¹⁵ Although the 1892 survey is for California and includes women in various service occupations (e.g., laundress, waitress, saleswoman), the earnings function estimated for the female observations is nearly identical to that from data covering a large number of cities and industries in 1888. See Goldin (1990, chapter 4), which also contains a discussion of earnings functions and historical data.

employee works for the same firm and in the same occupation since beginning paid employment, then the earnings function with respect to experience is given by the sum of the coefficients on total experience, years in occupation, and years with firm.

As can be seen from the means of the cross section, male workers remained in the same occupation for much of their work history but changed their firms with more regularity.¹⁶ Women had shorter total experience and remained with their current firm for almost the same number of years that they had the same occupation. In the discussion that follows I have aggregated all three forms of work experience. The findings are not demonstrably altered if, instead, I assume that the occupations did not change since paid employment began but that employment with the firm just began.¹⁷

The male (log) earnings function, estimated as a quadratic in total work experience, has a small squared term, whereas the female function, also estimated as a quadratic, has a much larger squared term and thus more curvature. Almost all women working in factories labored fewer than eight years. The mean of total work experience for women was five years and that for men was about 15 years. Until about 12 years of work experience the earnings functions for men and women are virtually parallel. The female earnings function actually rises with work experience somewhat more than does that for males. Similar to the observation just made about the schematic representation in Figure 6a, the most quantitatively important part of the difference in male and female earnings, given the observables, is due to the initial disparity in wages and *not* to differences in the return to the observables. In fact, across the entire sample the intercept

¹⁶ These are not necessarily the means from longitudinal data.

¹⁷ The earnings function, if total work experience (Exp) is coterminous with that in an occupation and for an employer, is: $\log w = C + 0.0849 Exp - 0.0014 Exp^2$ for males and $\log w = C + 0.1646 Exp - 0.0055 Exp^2$ for females where C = all other factors.

explains all of the difference in male and female earnings, conditional on the observables.¹⁸

One potentially complicating factor is that married men earned almost 17 percent more than unmarried men, conditional on the other observables, but that married women did not earn more (or less) than single women. But even if the intercept is computed for the unmarried, it explains almost the entire gap. I further discuss the “marriage premium” in the section on office workers.

Thus “wage discrimination” in manufacturing existed primarily because of differences in the intercept terms. If anything, differences in the coefficients served to *decrease* earnings differences between men and women. The same was not true for office employments.

Earnings Functions in Fact: Brain Jobs

Clerical employments, the brain jobs, had earnings functions for men and women beginning sometime in the early twentieth century that can be far better represented by Figure 6b than by Figure 6a. In the schematic representation of Figure 6b, initial earnings for men and women are nearly the same. But even though time on the job leads to increases in the earnings of men and women, the increases are considerably less for women.

Because brain jobs are obtained after education in high school, college, or at a commercial institute, the notion of the intercept is a bit more complicated than that in Figure 6a. One must also take into account the level of education achieved and the value of education to each sex. There are several ways to do this in a regression context.

One method pools the data for men and women, adds a dummy variable for “female,”

¹⁸ The intercept difference for unmarried males and unmarried females using the Table 2 results is 0.466, the difference for all males and all females is 0.524, and that for married males and females is 0.632. The log wage difference estimated at 4.95 years of total experience (the mean for females) is 0.521 and that at 15.02 years (the mean for males) is 0.512. Therefore, the intercept difference explains almost the entire difference in earnings for unmarried males and females given the observables and explains more than the entire difference when the intercept includes all or part of the “marriage premium” for men.

and uses the coefficient on “female” as the difference in earnings by sex for beginning workers. An extension of this method is to interact the education and training variables (and any others that are predetermined) with “female.” The difference in the intercepts would be the coefficient on “female” plus those on the interaction terms multiplied by the means of the variables. Yet another way to compute the difference in the intercepts by sex is to estimate earnings functions for each sex, add the estimated value of education to the intercept term, and take the difference. The results from each of the methods for the data set I will be using are fairly similar. The data set is for 1939 and was collected from a Department of Labor, Women’s Bureau survey of firms that hired office workers in five U.S. cities (Houston, Kansas City, Los Angeles, Philadelphia, and Richmond).¹⁹ The data for Philadelphia were coded from the original forms housed in the National Archives and the sample contains about 3,000 observations about equally divided between men and women.²⁰

Table 3 gives the estimated earnings functions where the explanatory variables are tenure, total office experience, years of high school, college or university, and business school.²¹ Earnings at the start of office work were 7 percent higher for men than for women if all were unmarried and had four years of high school but no other education or training. The difference would rise to 10 percent if both had one year of university, but would decline to 6 percent if both had one year of business college (and no university).²²

¹⁹ The data were collected in 1940 but inquired of earnings and occupations in 1939. See U.S. Department of Labor, Women’s Bureau (1942).

²⁰ See Data Appendix in Goldin (1990). The original sample used in Goldin (1990) contained 1,206 observations. Additional data from the original surveys of Women’s Bureau Bulletin No. 188, at the National Archives, were collected bringing the total usable sample size to 2,948.

²¹ Business school means some type of business training in a proprietary institution generally called a “business college.”

²² There is no information on college/university major and far more of the men than the women must have done drafting, engineering, and accounting degrees that enabled them to be placed in more lucrative positions. Even though most college educated women advanced no further than secretary, it is possible

As in the case of manufacturing workers, a complicating factor is that married male office workers earned, on average, 13 percent more than did unmarried male office workers but no difference existed by marital status for female office workers. During the Great Depression firms stated they had policies to pay married men more than single men and thus, presumably, more than married and single women with the same qualifications. A male marriage premium, of similar relative magnitude, has also been found in more recent data. Fixed effect estimation suggests that perhaps 80 percent of the premium is due to a “productivity” increase, rather than selection differences into marriage.²³ If the same held for the 1930s, then only a small part of the difference by sex would be due to different pay for similar characteristics. A more jaundiced view is that today, and in the past, married men are awarded a premium that is neither due to selection nor to productivity differences. Rather, the premium arises from a social dictum that firms should provide for men’s families.

Even though the intercept terms are similar by sex, the earnings function rises more steeply with work experience for men than it does for women. After five years in office work the average man earned 8 percent more than the average woman, after ten years the average man earned 14 percent more, and after 15 years the difference widened to 21 percent.²⁴ Thus the earnings functions for office work in 1940 are rather different from those for manufacturing employments in 1900. Male and female earnings in office (brain) work were far more similar at the start compared with their earnings in industrial (brawn) employment. But whereas the ratio

with these data to determine whether college preparation is the reason for the better placement of college men.

²³ Korenman and Neumark (1991). The 80 percent figure given by these authors could be an overstatement if the reason that men marry is that they matured sufficiently. They would then be more productive and be married, but marriage would not be a “treatment.”

²⁴ These calculations assume that total office experience and that with the current firm are the same. That is, I assume that office experience for the worker began with the current employer. The assumption is not far from the facts given by the means in Table 3.

of their earnings remained the same in industrial work, it widened with every year in office employment.

The Women's Bureau survey also provided retrospective information and asked the occupation that each worker had at the start of office work and the occupation at the time of the survey. At the beginning of all office employment men who had graduated high school but went no further with their formal education had positions such as messenger, mail boy, mimeo-machine operator, and lower-skilled clerk, most of which were low paying jobs. Most women with the same level of education had positions such as stenographer, typist, switchboard operator, and secretary. Although some were lower-paying positions, most paid a moderate amount. After an equivalent period of time in office work and with the same firm, men often advanced to positions such as those in the accounting group, manager, and supervisor, whereas most women remained in the positions they had at entry, be they stenographer, typist, or secretary. Some did advance from typist to secretary, but advancement rarely went further no matter how much experience they accumulated.

Firm-Level Policies in Offices

Women were not advanced at the same rate that men were in most office settings and in the larger offices they were rarely advanced at all. Their lack of promotion is a mechanical explanation for why women's earnings fell behind men's with time on the job. There are many possible underlying reasons for the career stagnation of women and only some concern the bias of those who made promotion decisions. But some of the reasons are related to bias and can be discerned from firm-level policies that restricted certain jobs to men and other jobs to women.

The policies, which first appeared in the early 1900s, did *not* limit all the well paying jobs

to men and all the menial jobs to women. Rather, many menial starting jobs, as I just noted, were among those reserved for men and some that required a modicum of training were among those reserved for women. Although it might not seem odd that certain jobs were reserved for men, it might, at first glance, appear curious that any jobs were barred to men and that many of the more menial positions were reserved for men.

Firm level policies are difficult to track today and they are generally more difficult to track historically.²⁵ But because the Women's Bureau of the Department of Labor surveyed hundreds of firms we know a considerable amount about firm policies in the 1920s and the 1930s.

The Women's Bureau study that was the basis for the individual-level data set just used also contained a related set of questions inquired at the firm level.²⁶ Several hundred firms in each city, across virtually all sectors, were surveyed and a firm representative, generally a top ranking manager or human resource officer, answered questions about employment practices and policies.²⁷ According to the Women's Bureau the survey was designed to study the use of office machinery by firms. The survey did ask about the use of office machinery and included, as well, many useful questions about the size and composition of the firm. Other innocuous questions were asked about employment policies of various types, such as centralized hiring, paid vacations, sick days, and others that reveal the existence of modern labor market practices. But another set of questions belies the stated reason for the survey and seems less innocuous.

²⁵ See Blau (1977) on sex segregation by firms within occupational categories.

²⁶ The Women's Bureau performed an earlier survey of firms, in 1931, that asked similar questions regarding discrimination on the basis of marital status and that was also taken to determine the effects of mechanization on employment. That survey reflected firm policies before the Great Depression, although it also revealed changes at the onset of the economic downturn. Only the firm-level portion survives (in the National Archives) and is considerably smaller and less complete than is the survey for 1939. See Department of Labor, Women's Bureau (1934) and Goldin (1990, 1991).

²⁷ The sectors include manufacturing, law, real estate, retail, service, education, government, public utilities, railroad, communications, insurance, banking, and advertising.

The survey inquired about practices and policies that *today* might reveal sex, age, marital status, race, and ethnic discrimination or employment bias. I have produced a facsimile of the survey as Figure 7. The Women's Bureau asked the minimum and maximum ages for hiring, if the firm had policies with regard to race or color, whether married women were employed, and whether single women in the employ of the firm were dismissed if they married. It also requested a list of the jobs that were, by policy, open to men only and those that were open to women only.

Although these questions appear loaded from our standpoint, there was apparently no hesitation on the part of the respondents to answer them. About one-third of the firms responded that they had a policy that discriminated by race or color and most of these stated that they did not hire African-Americans in clerical positions. Many firms boasted that they engaged in no race discrimination, but would not hire "Negroes" in office positions.²⁸ Other firms noted that they hired neither Jews nor blacks. Firms were equally at ease in admitting they had policies that dismissed single women when they married and disallowed the employment of married women at all. It was, after all, the ninth year of the Great Depression. Many firms proudly added that they paid married men more than single men.

As interesting as these questions are, the ones that interest me here are those that asked which jobs were restricted to women only and which to men only *by firm policy*. I will summarize the answers to these questions from several hundred of these records.²⁹

Fully 72 percent of the surveyed firms (with ten or more female and ten or more male

²⁸ The category of "race" on the form appears to have meant the various European nationalities whereas "color" meant African American, white, and Asian.

²⁹ The data set consists of 329 firms in Kansas City, Los Angeles, and Philadelphia that hired office workers. The data I summarize are for the 195 firms with 10 or more male employees and 10 or more female employees because the answers are meaningful only if the firms hired both sexes and were sufficiently large to have positions that could have been reserved for one or the other sex. See also Goldin (1990, chapter 5).

office employees) had policies that reserved some positions to men, and an equal percentage had policies regarding women's jobs. About 63 percent of all firms had policies that restricted *both* male and female jobs, reserving some for men and some for women. Interestingly, whereas 46 percent of the firms admitted to employment restrictions based on race, 52 percent of the firms that limited positions to women only did so.³⁰

The jobs that were restricted to "women only" were often those that required training *before* job entry (in stenography, comptometer operations, typing, and the use of bookkeeping machinery, to list a few) but did not lead to advanced positions except possibly to that of secretary.³¹ The jobs restricted to "men only" were the advanced positions, such as auditor, cashier, supervisor and most positions leading to them. Some of these ladder positions appear rather menial, such as messenger, office boy ("source of future staff"), and certain bookkeeping jobs ("so men can learn the business").³²

We have, historically, become so familiar with, and thus inured to, policies similar to these that we often do not question why firms restricted jobs by sex. What were firms gaining from the restrictions that kept women out of certain jobs ("men only") and those that kept men out of other jobs ("women only")?

The easier part of this question concerns why some positions were reserved for men. Such a restriction can be viewed as outright Becker-type discrimination (group A prefers not to associate with group B) with all of its segregation and wage consequences. I will shortly discuss a framework that I term a "pollution theory" of discrimination, which I believe can better address

³⁰ There is no significant correlation between racial bias and employment restrictions for men's jobs.

³¹ A few surveys remarked that certain jobs were restricted to men because they entailed night work or heavy lifting. I am excluding these restrictions from this discussion since they concern differences in strength and involve positions that may have been covered by state regulations.

³² Quoted in the surveys for the insurance companies Metropolitan Life ("office boy") and General Accident ("bookkeeping") both in Philadelphia. National Archives, Record Group #86, Boxes 496-500.

the question. It is one in which there is asymmetric information concerning women's productivity and in which both prestige and income from a job give utility to men.

The answer to the second question—why did firms restrict jobs to be female only—follows from the first. If women are barred from jobs that have an internal ladder and lead to the good jobs, then they receive only those jobs that do not have advancement possibilities. These positions become quintessentially “dead end” jobs. If a man were in such a job, he would complain. According to the official at Leeds and Northrop in Philadelphia, the firm had a policy of not hiring men as a bookkeeping machine operator, stenographer, or secretary since there was “no chance for advancement for men, hence they would be dissatisfied.”³³ Therefore, firms barred men from those positions. The result was that the jobs offered to women were neither high on the income distribution, nor were they the very lowest paying positions. We will see that this is an implication of the “pollution theory.”

Household Production and Childcare before 1950

Before I describe the framework for understanding the rising significance of gender, I must settle a nagging issue. My reference to the possibility of real change in the 1920s, may have stirred some doubts about its practicality. Childcare responsibilities were even greater in the 1920s than they are today. Household production, one might think, had not changed much for centuries. That is, it might appear that the labor supply function for married women would not have shifted out by much, if at all, by the 1920s and that it would have been rather inelastic with respect to women's wages. In some sense the characterization that household production had not changed much is correct. But in other ways it is not. There was change, some of it rather large.

³³ National Archives, Record Group #86, Boxes 496-500.

Fertility in the 1920s was actually at an all time low in the United States and it continued to decrease into the Great Depression. For the cohort of women born in around 1905, the lifetime number of children ever born per married woman was as low as it would be for any cohort of American women until that born around 1945. Furthermore, the fraction of ever-married (white) women with zero births over her lifetime was about 20 percent for the cohort born around 1905. Today the figure is 13.3 percent for all 35 to 44 year old ever-married women and 14.2 percent for 35 to 44 year old non-Hispanic whites. The conclusion is clear: the cohort born around 1905 had few children and a large fraction had no children.

The household, however, still involved considerable labor. But by 1924, 65 percent of urban households had electricity and 80 percent would by 1930. Electric irons and mechanical washing machines were diffusing rapidly; refrigerators and vacuum cleaners would come just a bit later. My point is that gender differences in the labor market would have mattered far less had economic and educational changes in the early part of the twentieth century been given the chance to flower. The question, then, is why they were not given a chance.

The Pollution Theory of Discrimination

What were the forces behind the “rising significance of gender”? Those familiar with a Becker-type model of discrimination, in which one group has a preference not to work or interact with another group, might think that it will suffice.³⁴ But think again. Every man has a mother, most have wives, and some men have sisters. Men do not seem to be averse to being around women in the same way that Arabs and Jews are, Catholics and Protestants have been, and whites and non-whites still are in many parts of the nation. Discrimination against women is different. One has to find the *reason* why men are averse to having women in their job.

³⁴ Becker (1957).

Perhaps a version of the “statistical discrimination” framework will be better for my purposes.³⁵ In a statistical discrimination model, group identity (e.g., sex, race) provides additional information regarding an attribute such as productivity, criminality, or reliability. Two groups (e.g., men and women) have a productivity characteristic not directly observable for any individual. The distribution of the characteristic for each of the groups is known, however. A test is devised to ascertain the value of the characteristic, but the test is an imperfect predictor and is more reliable for one of the groups, men in this case. Under such a circumstance, more weight will be placed on the test for men than for women. The wage for a worker is the value of expected productivity, which is a weighted average of the test score for that particular worker and the group mean. The weights are the reliability of the test or the signal to noise ratio of the test. If men and women have the same distribution of the characteristic, then women who score higher than the mean will be paid less than men with equal scores and the reverse will be true for women who score lower than the mean.

Both the Becker model of discrimination and the statistical discrimination framework have important and insightful implications, but neither fits the historical facts concerning occupational segregation by sex. I have, therefore, formulated another framework, which I call the “pollution theory” model of discrimination. It is a hybrid model: tastes or preferences matter, as in the Becker model, and there is asymmetric information, as in the statistical discrimination framework.

The model is straightforward although the actual workings of it are less so. The simple intuition is that men want to keep women out of certain jobs because women “pollute” the

³⁵ Phelps (1972) and Arrow (1973) began the literature on “statistical discrimination.” See also Aigner and Cain (1977).

prestige that men get from being in those jobs.³⁶ Women's entry into these jobs indicates or signals that the qualifications for the job have been reduced and this reduces the prestige that is accorded to men in these occupations.

The model has two periods. In period 1 all men, but no women, are employed and they are in occupations commensurate with their skill. The skill of both men and women is measured by a single-valued characteristic, C (e.g., analytical ability, strength, creativity). Thus, if C were analytical ability, a high value of C would be required to be an engineer or a chemist and a low value would be required to be a laborer or a factory operative. There is one and only one occupation for which each level of C is the minimum level required. A competitive equilibrium in workers will result if each man is employed in the occupation for which his value of C is the minimum value required. In the version of the model summarized here, I assume that the demand for the output of each occupation is infinitely elastic (that is, output prices are given) and therefore that there is no "crowding" in any occupation. That is, even if women could enter an occupation, they would not depress the wages of men and therefore this is not the reason men will oppose the entry of women.

An important aspect of the model concerns asymmetries in information. The distribution of C for men, the median of C for women, and the value of C for each occupation in period 1 are known by all. But the value of C for any particular woman is known only to her and to her prospective employer. Another informational asymmetry concerns whether a technological shock has occurred. Thus only those currently in the occupation know whether the minimum level of C needed for an occupation has changed.

In period 2 women apply to enter the occupations currently filled by only men. In this sense, the model contains an important historical element. In 1900, for example, many

³⁶ See Akerlof and Kranton (2000) on a related model of identity.

occupations contained few or no women in part because the labor force participation of married women was extremely low.

Jobs confer both a wage, which is a function of C , and a level of “prestige,” which is initially a function of the minimum level of C known to be required for the job in period 1. When a woman tries to enter a currently all-male occupation her skill level is assumed, by those *outside* the occupation, to be the *median* skill level of all women rather than her actual skill level, which is not known by those outside the occupation. The prestige a male worker receives from being in an occupation is conferred by those *outside* the occupation, for example by those in his community or in the local bar or at the sports club. Thus the skill level that is *believed* to be required for the occupation is the only aspect of the occupation that matters for the prestige level.

Because the initial level of C for each occupation is known, why should the prestige from an occupation change when a woman enters it? The reason is that technological shocks are randomly experienced by occupations and these shocks reduce the minimum level of skill required for the occupation.³⁷ (Recall that only those in the occupation know the exact nature of the shock.) A woman who tries to enter a (male) job having a skill requirement above the skill of the median woman will encounter serious opposition from male workers. Her entry will *signal that the occupation was hit by one of these random shocks*. Note that because demand is infinitely elastic, there are no wage effects. Men are not hostile to women because their entry will depress wages.

As an example, consider the occupation of firefighting. Until very recently there were virtually no female firefighters in the United States. Even today there are many municipalities that do not employ any women firefighters. Firefighter recruits must pass a grueling physical test that involves carrying a heavy pack, running up many flights of stairs, and performing

³⁷ I consider only technological shocks that decrease the minimum skill needed for the job.

various firefighting tasks. As equipment became lighter due to technological changes, such as that in hose construction, the physical tests were changed and many more women were able to pass them. Male firefighters in various parts of the United States challenged the hiring of women by adding tasks to the new tests and by harassing women who passed the tests and were brought into the force.³⁸ In the pollution framework, male firefighters were protecting the “prestige” of their occupation by changing the test and harassing female firefighters. But even if the technology had not changed and even if a woman could pass the test, men might still want to prevent a woman from entering. The reason is that no one would know if the occupation were hit with a random technology shock that reduced the skill required for the occupation.

An implication of the pollution theory model is that jobs will be segregated by sex above the median level of the productivity characteristic (C) for women, *even if men and women have the same distribution of productivity*. Jobs will be integrated by sex below the median level of C for women. Because of the asymmetric information setup of the framework, women cannot gain entry into jobs above the median of their productivity characteristic because they will be perceived as polluting the prestige of the men in those occupations.

But, if women can be “credentialized,” that is if they can prove to all that they are equal to the men already in the occupation, there will be no decrease in prestige with their entry. I contend that this credentialization was an important part of the “declining significance of gender.” Beginning in the late 1960s and early 1970s young women entered professional schools to train as managers, doctors, and lawyers, among others. The possible reasons that women increased their numbers in professional schools, especially those conferring credentials,

³⁸ Among the various high-profile cases is *Berkman v. City of New York* (U.S. District Court, 626 F. Supp. 591, 1985), in which two New York City female firefighters were physically harassed and the physical test for advancement from the probationary position was altered. A harassment case in Florida was settled by three female firefighters against the Reedy Creek Improvement District and Walt Disney World (*The Orlando Sentinel*, October 29, 1996, p. D1).

include the resurgence of feminism in the 1960s, federal anti-discrimination legislation, and the diffusion of the oral contraceptives among young, unmarried women.³⁹

Implications of Male and Female “Brain” Jobs

Unlike the “brawn” jobs that had true requirements that actually limited women’s productivity in them, the new office jobs acquired an “aura of gender.” Jobs became “female” and jobs became “male.” One might say that jobs took on “secondary sex characteristics.” White collars faded into “pink” collars. The jobs that became “female” had been made into “dead end jobs.” The lower positions that were once the training ground for upper positions now became benches rather than a rung on a high ladder.

Because of these gender distinctions, the supply side movements from decreased birth rates and changes in household production technology never had a full chance to flower in the period from the 1920s to the 1960s. Even more important is that labor market and job investment dynamics were altered. Women did not have an incentive to remain in the labor force. Nor did they have much incentive to invest in various types of education and training.

The well-educated woman from the 1940s to the 1960s took a job that had a relatively “flat” earnings profile, such as teacher, librarian, social worker, or nurse.⁴⁰ These positions allowed for lifecycle interruptions with little earnings penalty. It is likely that many would have done the same even had the barriers just discussed not been in place. But there would have been many who did not.

Reverberations of the barriers to women’s advancement in ordinary white-collar work in

³⁹ See Goldin and Katz (2001) on the Pill, for example.

⁴⁰ In 1960 64 percent of college graduate, employed women were teachers (including music teachers), librarians, nurses, and social workers. *Source*: Integrated Public Use Micro-data Sample of the 1960 federal population census.

the 1920s to the 1940s surfaced in the 1950s and 1960s. Even college graduate women who wanted to be on the fast track, who wanted more than the dead-end positions, more than the “flat” earnings profile jobs, were often asked one simple question when they applied for work: “Can you type?”

Rather than a continuation of the increase in married women’s labor force participation among 20- and 30-year olds, there was stagnation. Rather than a continuation of the low birth rates, there was a resurgence of large families—the “baby boom.” The age at first marriage, even among college graduate women, was extremely low in the 1950s and 1960s. Half of all college graduate women married within two years of college graduation and that trend continued until the cohort born around 1950 in about 1973.

Was this because there was little else that women could do that was sustaining, particularly college-educated women? A strong argument can be made to that effect. Long-term gender change was slowed in the 1950s and 1960s by the forces that were put in place in the 1920s—the origins of “wage discrimination” that produced the “rising significance of gender.” But then something changed.

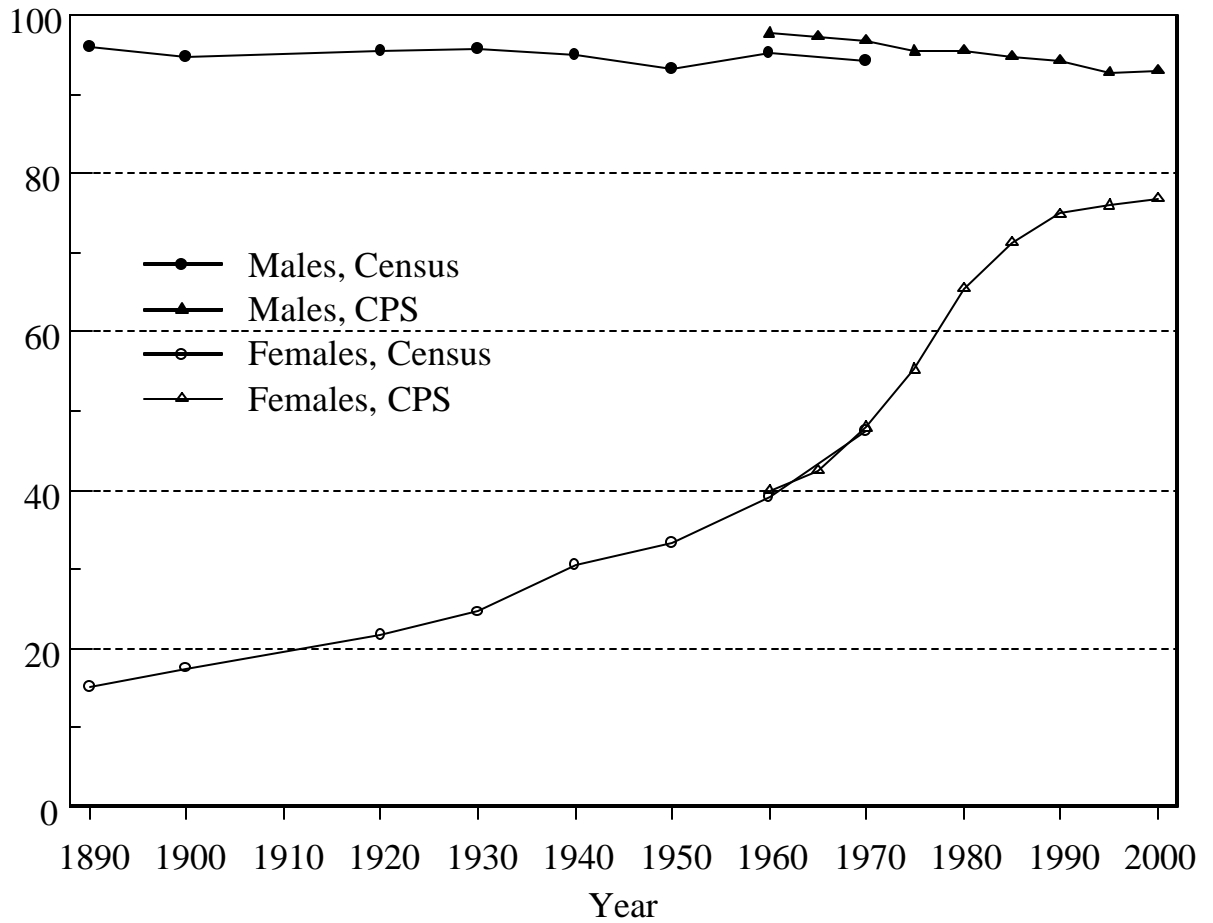
The Declining Significance of Gender: Summary and Conclusion

How did we move from a “rising” to a “declining” significance of gender? A summary of what I have said will lead to an answer. Recall that there were new jobs and greater levels of education in the 1920s that increased the participation of young women in the labor force. Policies arose at the firm level that created sex-segregated occupations. These, in turn, altered the incentives for education and training among women. A framework that can help us understand the origins of these policies is the “pollution theory” of discrimination, in which there

is asymmetric information concerning the productivity characteristic of women. Men are averse to having women enter their occupation when women's productivity is not observable and verifiable by all.

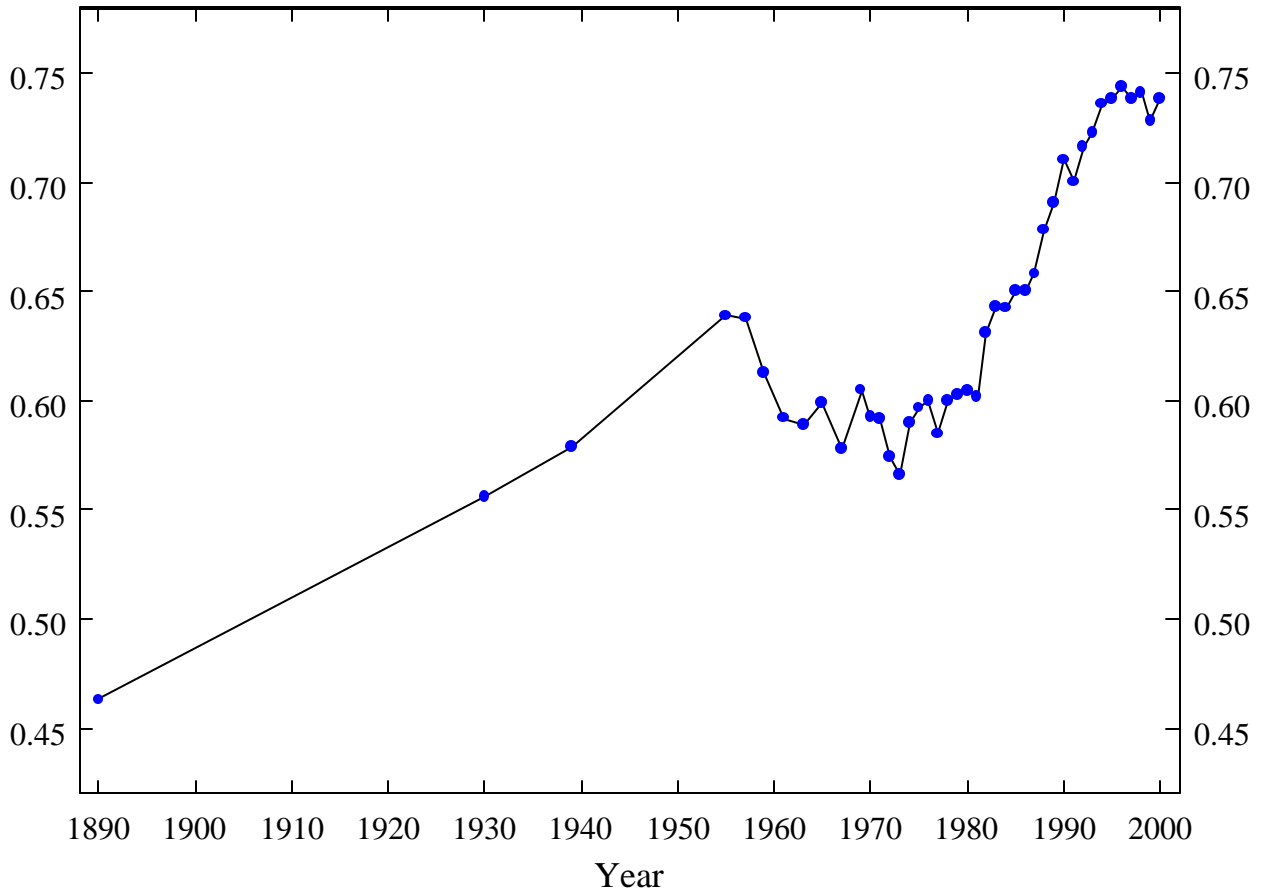
One way to break out of the world of "pollution" is to have the credentializing of various occupations. In the 1970s women became more "credentialized" by acquiring advanced degrees. There are many factors that could have produced this result. Among them are social factors such as feminism, the Pill, and the social upheaval of the Viet Nam war era. There is also government policy such as affirmative action, Civil Rights, and Title IX. In my own work I have emphasized the role of the Pill, but there is much room for the complementary effects of these other factors. This is not the place to examine the declining significance of gender in the second half of the twentieth century. My purpose, rather, has been to expose the fact that long before there was a declining significance of gender in the labor market there was a rising significance of gender and that it delayed real change.

Figure 1
 Labor Force Participation Rates of Men and Women 25 to 44 Years Old, 1890 to 2000



Sources: 1890 to 1960, Goldin (1990); 1960 to 2000 Current Population Surveys.

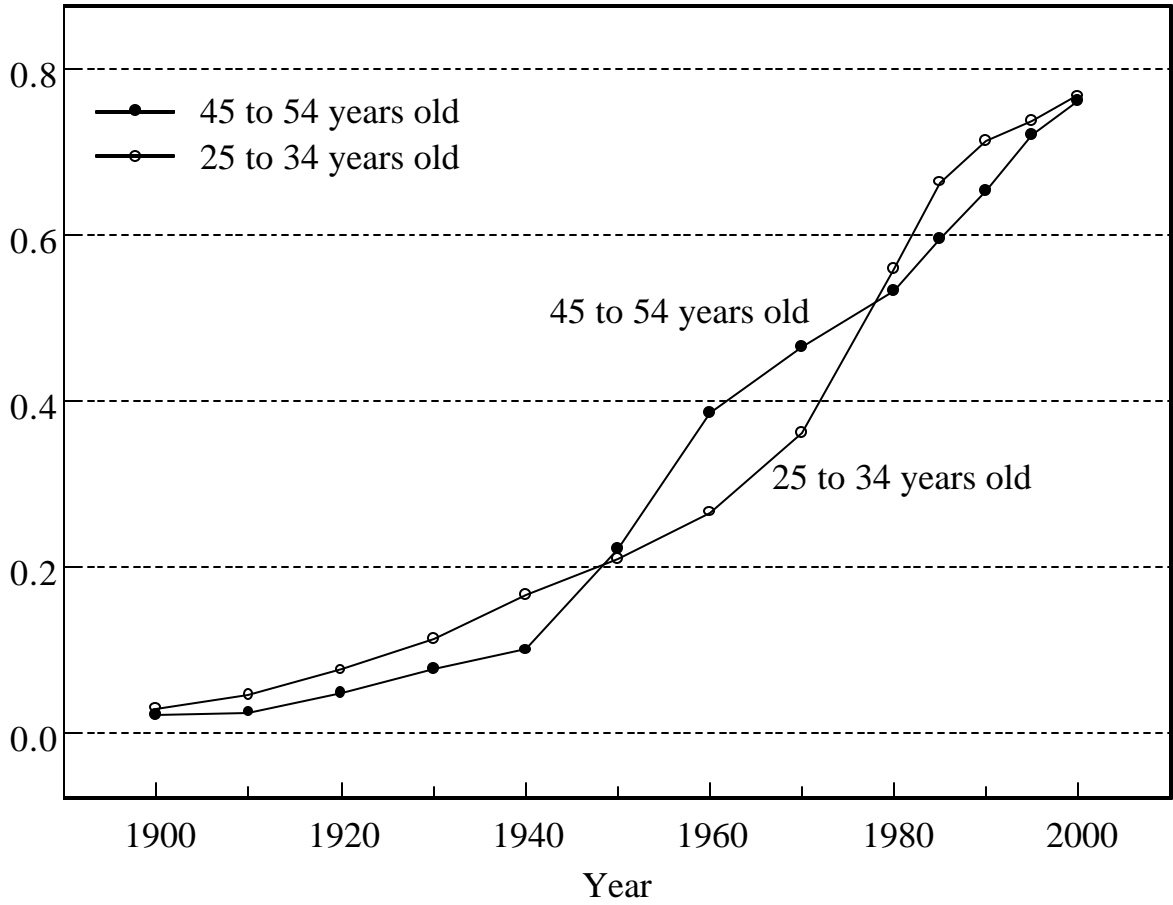
Figure 2
 Female/Male Median Earnings for Full-Time, Year-Round Workers



Sources: 1890 and 1930 Goldin (1990, table 3.2); 1955 to 1969: Goldin (1990, table 3.1) from Current Population Reports series P-60; 1939: O'Neill and Polachek (1993, table 1) from published volumes of the 1940 federal population census; 1970 to 2000: U.S. Census Bureau website, accessed March 23, 2002, <http://www.census.gov/hhec/income/histinc/p36.html>

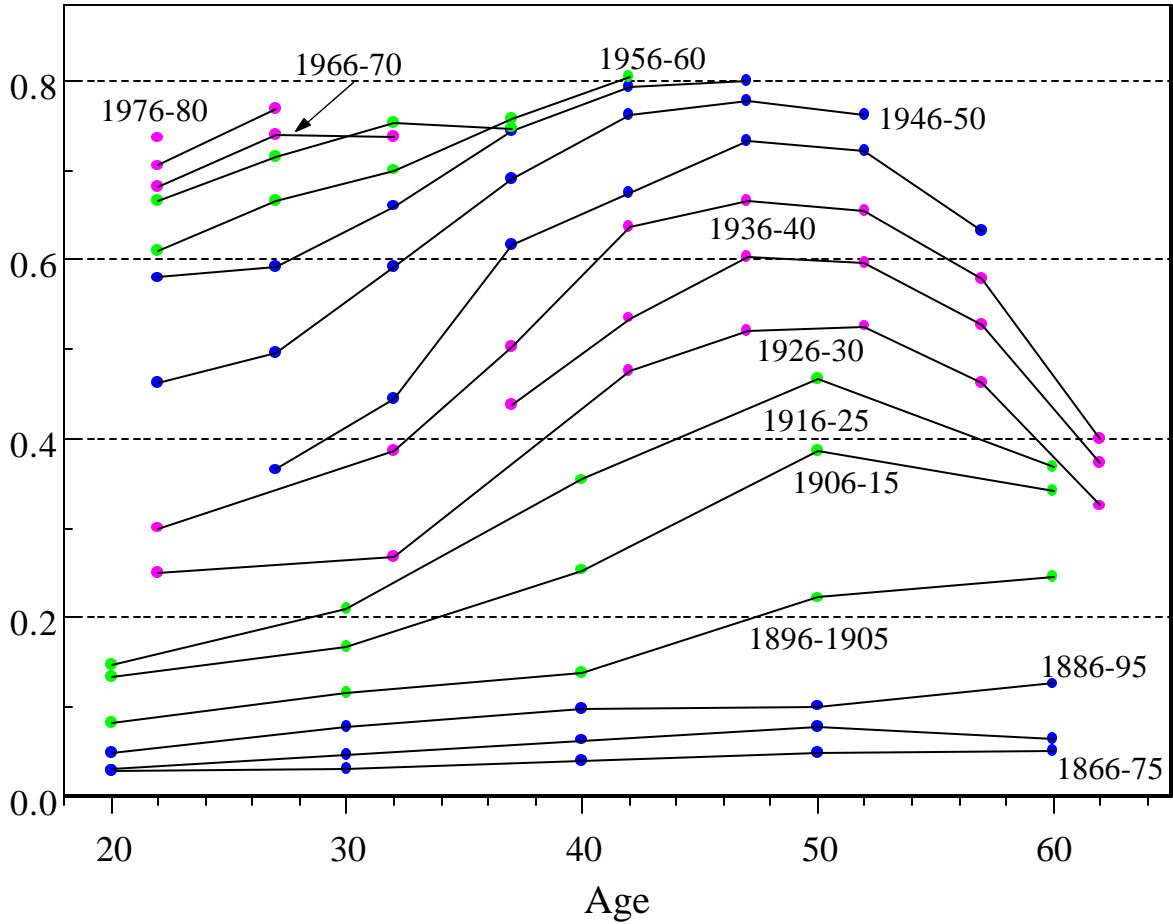
Notes: 1955 to 2000: Median, full-time, year-round workers (all races, all marital statuses) for 15 years and older after 1980 and 14 years and older before; 1890 and 1930: weighted average of annual, full-time earnings across all sectors. Earnings include wage and salary income before 1966 and total earnings subsequently.

Figure 3
Labor Force Participation Rates of Two Age Groups of Currently Married Women



Source: 1900 to 1980 (Goldin 1990); 1983 to 2000 Current Population Surveys.

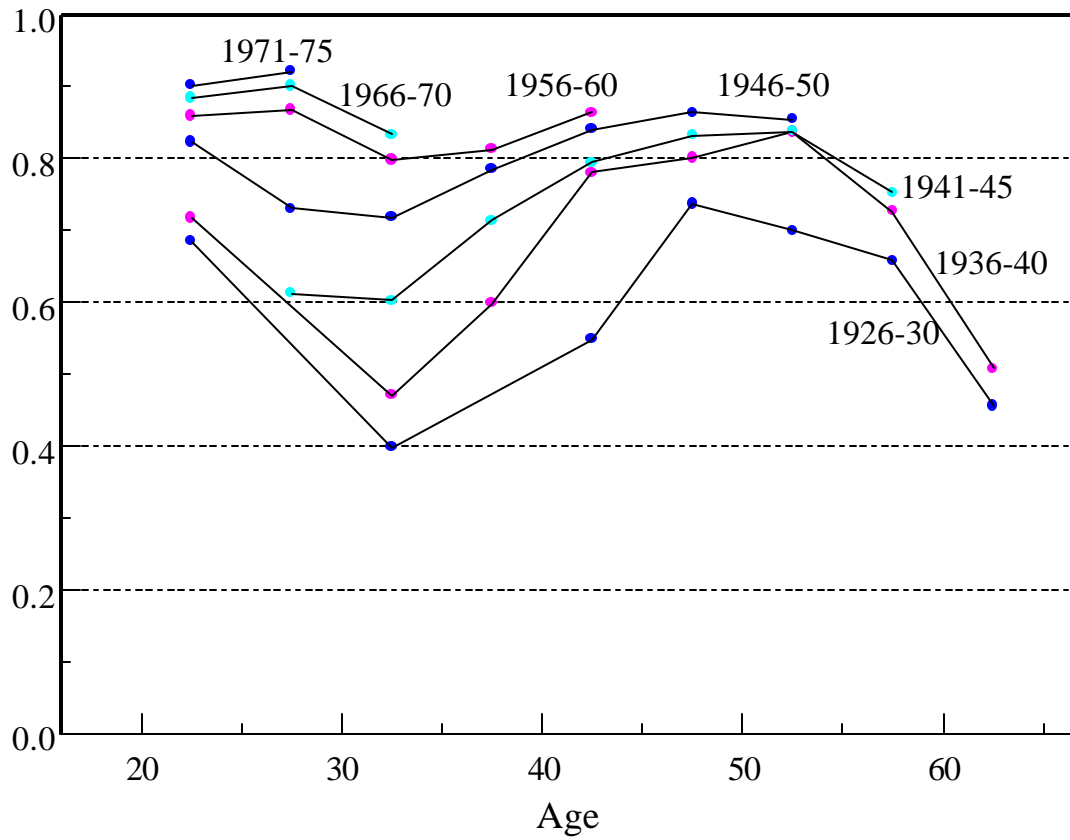
Figure 4
 Labor Force Participation Rates of Married Women



Sources: Birth cohorts 1899-75 to 1926-30, Goldin (1990); rest of cohorts from (March) Current Population Surveys.

Notes: Birth cohort dates are shown. Some dates are omitted when lines are close together, as in the case of the 1931-35, 1941-45, 1951-55, and 1961-65 cohorts.

Figure 5
Labor Force Participation Rates of College Graduate Women



Source: Current Population Surveys (March).

Figure 6: Schematic Diagrams of Male and Female Earnings Functions

Figure 6a: "Brawn" Jobs

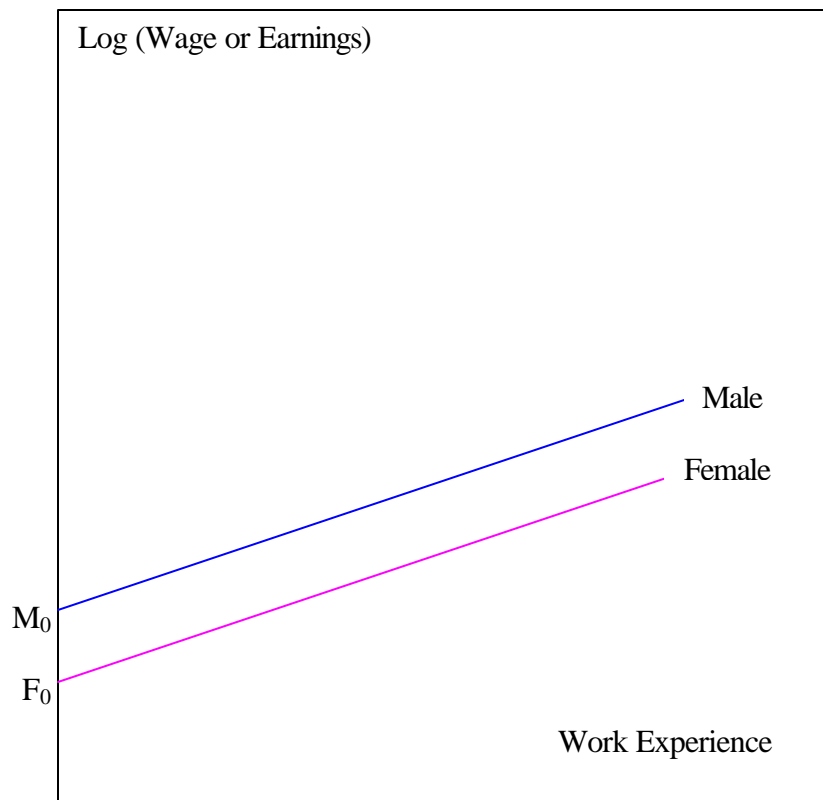


Figure 6b: "Brain" Jobs

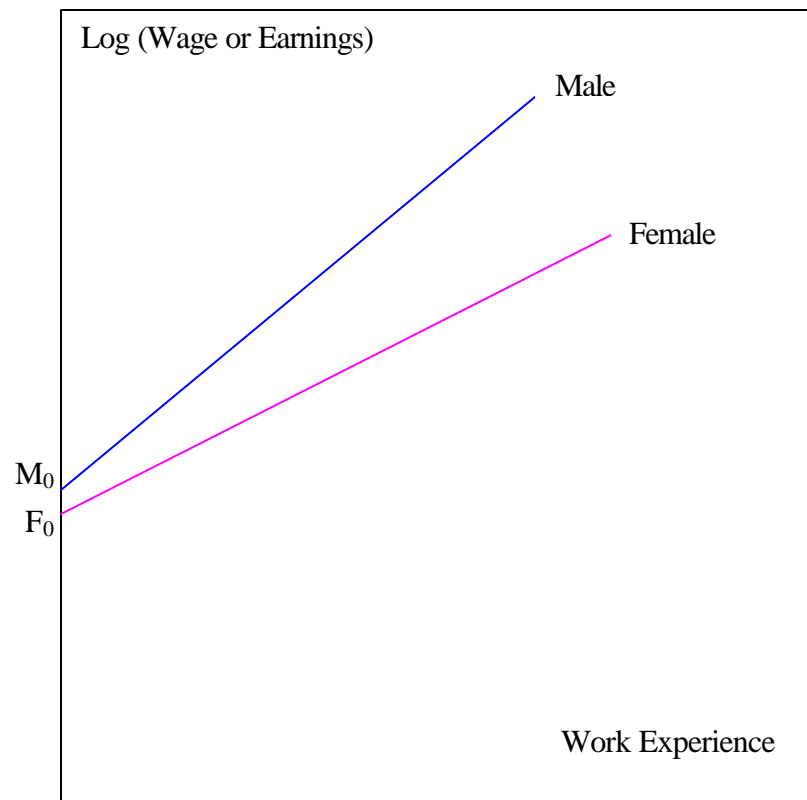


Figure 7
Facsimile of 1940 Women's Bureau Firm-Level Survey

Department of Labor	Agent _____
Women's Bureau	Date _____
OFFICE WORKERS' STUDY 1940	
1. Firm name _____ 2. Business _____ 3. Address _____	
4. Persons interviewed and positions _____	
5. Who are the executives? _____ administrators? _____ professional workers? _____	
	Men Women Total
6. # clerical workers regularly employed 1939	_____
7. # clerical workers employed as extras 1939	_____
8. # new clerical workers taken on in 1939	_____
9. Hours of work: Daily ____ Saturday ____ Total weekly ____ Overtime ____	
10. Office organization: list departments _____ types of machines used _____	
11. Method of wage payment: monthly, semimonthly, weekly, daily, hourly, piece, bonuses	
12. Employment requirements and practices (discuss by job where differences exist)	
a. Hiring: Who hires new employees? _____	
What are beginning rates of pay? _____ system of advancement? _____	
b. Source of applicants _____	
c. Age: Minimum ____ Maximum ____	
d. Marital status:	
Are married women employed? _____	
Are women who marry in service allowed to remain? _____	
e. Sex:	
Which jobs open to men only? _____	
To women only? _____	
f. Educational requirements:	
1. General _____ 2. Special business training _____	
g. Policies with reference to race and color _____	
13. General policies:	
Vacations with pay _____ To whom? _____ Length? _____	
Sick leave _____ Dismissal wage and notice _____	
Promotional policy and salary increases _____ Retirement plans _____	
Organization: Trade union or other _____	
Other welfare activities _____	

Source: National Archives, Record Group #86, Boxes 496-500, see Goldin (1990, Data Appendix).

Note: Questions discussed in the text are in bold.

Table 1
Occupational Distributions for Major Occupational Groups, by Sex: 1900 to 1970

	1900	1910	1920	1930	1940	1950	1960	1970
<i>Males (14 years old and older)</i>								
Total (000)	23,711	29,847	33,569	37,933	39,168	42,554	43,531	46,970
White-collar workers	0.176	0.202	0.214	0.252	0.266	0.305	0.354	0.398
Professional, technical, etc.	0.034	0.035	0.038	0.048	0.058	0.072	0.104	0.141
Managers, officials, etc.	0.068	0.078	0.078	0.086	0.086	0.105	0.108	0.111
Clerical, etc.	0.028	0.044	0.053	0.055	0.058	0.064	0.072	0.076
Salesworkers	0.046	0.046	0.045	0.061	0.065	0.064	0.070	0.071
Manual & service workers	0.408	0.451	0.482	0.500	0.517	0.546	0.561	0.557
Manual workers	0.376	0.413	0.445	0.452	0.456	0.484	0.497	0.475
Craftsmen, foremen, etc.	0.126	0.141	0.160	0.162	0.155	0.190	0.206	0.211
Operatives, etc.	0.104	0.125	0.144	0.154	0.180	0.206	0.212	0.196
Laborers, exc. farm & mine	0.147	0.147	0.140	0.137	0.121	0.088	0.078	0.069
Service workers	0.031	0.039	0.037	0.048	0.061	0.062	0.065	0.082
Private household workers	0.002	0.002	0.002	0.002	0.004	0.002	0.002	0.001
Service, exc. private household	0.029	0.036	0.036	0.046	0.057	0.060	0.063	0.081
Farmworkers	0.417	0.347	0.305	0.248	0.217	0.149	0.085	0.045
Farmers & farm managers	0.230	0.197	0.184	0.152	0.133	0.100	0.055	0.027
Farm laborers & foremen	0.187	0.150	0.121	0.096	0.084	0.049	0.030	0.018
<i>Females (14 years old and older)</i>								
Total (000)	5,319	7,445	8,637	10,752	12,574	16,445	21,005	28,453
White-collar workers	0.178	0.261	0.388	0.442	0.449	0.525	0.563	0.613
Professional, technical, etc.	0.082	0.098	0.117	0.138	0.128	0.122	0.133	0.155
Managers, officials, etc.	0.014	0.020	0.022	0.027	0.033	0.043	0.038	0.036
Clerical, etc.	0.040	0.092	0.187	0.209	0.215	0.274	0.309	0.348
Salesworkers	0.043	0.051	0.063	0.069	0.074	0.086	0.083	0.074
Manual & service workers	0.632	0.581	0.476	0.473	0.511	0.439	0.418	0.309
Manual workers	0.278	0.257	0.238	0.199	0.216	0.224	0.191	0.141
Craftsmen, foremen, etc.	0.014	0.014	0.012	0.010	0.011	0.015	0.013	0.018
Operatives, etc.	0.238	0.229	0.202	0.174	0.195	0.200	0.172	0.148
Laborers, exc. farm & mine	0.026	0.014	0.023	0.015	0.011	0.009	0.006	0.010
Service workers	0.355	0.324	0.239	0.275	0.294	0.215	0.228	0.202
Private household workers	0.287	0.240	0.158	0.176	0.181	0.089	0.084	0.039
Service, exc. private household	0.068	0.085	0.081	0.097	0.113	0.126	0.144	0.163
Farmworkers	0.190	0.158	0.135	0.084	0.040	0.037	0.019	0.014
Farmers & farm managers	0.059	0.038	0.032	0.025	0.013	0.007	0.006	0.002
Farm laborers & foremen	0.131	0.120	0.103	0.060	0.028	0.029	0.013	0.006

Source: U.S. Bureau of the Census (1975), series D 182-232.

Notes: 1950 uses the 1950 uses 1950 classification; 1960 uses 1950 classification.

Table 2
Earnings Functions for Manufacturing Workers: Males and Females, 1892

	Males		Females	
	Coefficient (t-statistic)	Mean	Coefficient (t-statistic)	Mean
<i>Dependent variable:</i>				
Log (weekly earnings)		2.688		1.902
Constant	1.75 (24.06)		1.14 (10.87)	
Total experience	0.0524 (8.59)	15.02	0.0333 (2.31)	4.95
Total experience ²	-0.0009 (6.62)		-0.0011 (3.16)	
Years in occupation	0.0212 (3.30)	10.39	0.1077 (5.44)	3.76
Years in occupation ²	-0.0004 (2.51)		-0.0030 (4.43)	
Years with firm	0.0113 (1.20)	3.92	0.0236 (1.06)	2.57
Years with firm ²	-0.0001 (0.04)		-0.0014 (1.02)	
Never married	-0.1663 (3.24)	0.65	-0.0005 (0.01)	0.91
Maturity or schooling ^a	0.0247 (4.00)	8.47	0.0195 (2.12)	9.62
R^2	0.28		0.42	
Number of observations	833		228	

^a Variable is (age – age work began – 6) and is some combination of years of education and “maturity” as measured by age conditional on total experience. Eichengreen (1984) terms this variable “schooling.” See Goldin (1990, p. 102, fn. 22) for a justification concerning why the variable is picking up maturity more than actual schooling.

Source: Eichengreen (1984).

Notes: “Total experience” is years since entering paid employment, “years in occupation” is the number of years the worker was employed in the current occupation, and “years with firm” is the number of years employed by the current firm. The data are primarily for manufacturing workers. Some male workers were in the construction industry and some female workers were in the service sector (e.g., laundresses, waitresses, saleswomen).

Table 3
Earnings Functions for Office Workers: 1940

	Males		Females	
	Coefficient (t-statistic)	Mean	Coefficient (t-statistic)	Mean
<i>Dependent variable:</i>				
Log (annual earnings)		7.339		6.951
Constant	6.54 (233.1)		6.46 (267.9)	
Years with firm	0.0106 (3.065)	10.21	0.0112 (3.49)	7.61
Years with firm ²	0.00010 (0.967)		0.00017 (1.49)	
Total office experience	0.0515 (14.25)	12.77	0.0363 (11.86)	10.39
Total office experience ²	-0.000872 (9.08)		-0.000711 (7.66)	
Married	0.132 (7.84)	0.484	-0.00481 (0.327)	0.197
Years of high school	0.0364 (6.09)	3.18	0.0395 (7.86)	3.22
Years of college/university	0.0827 (15.52)	0.724	0.0466 (7.30)	0.274
Years of business training	0.0307 (2.43)	0.184	0.0366 (3.64)	0.292
R^2	0.633		0.488	
Number of observations	1,492		1,395	

Source: 1940 Office Worker Survey (see Goldin 1990, Data Appendix) from the National Archives, Record Group #86, Boxes 472-486.

Notes: Only those with greater than or equal to 8 years of elementary school are included, which excludes 2.1 percent of the sample. “Years with the firm” is the number of years the worker was employed by the current firm. “Total office experience” is the number of years the worker was employed in any office job. Most workers in the survey were employed solely in office positions and thus this variable is the same as all work experience.

References

- Aigner, Dennis J. and Glen G. Cain. 1977. "Statistical Theories of Discrimination in Labor Markets," *Industrial Labor Relations Review* 30 (January): 175-87.
- Akerlof, George A., and Rachel E. Kranton. 2000. "Economics and Identity," *Quarterly Journal of Economics* 115 (August): 715-753.
- Arrow, Kenneth J. 1973. "The Theory of Discrimination." In Orley Ashenfelter and Albert Rees, eds., *Discrimination in Labor Markets*. Princeton: Princeton University Press.
- Becker, Gary S. 1957. *The Economics of Discrimination*. Chicago: University of Chicago Press.
- Blau, Francine. 1977. *Equal Pay in the Office*. Lexington, MA: Lexington Books.
- Easterlin, Richard A. 1980. *Birth and Fortune: The Impact of Numbers on Personal Welfare*. New York: Basic Books.
- Eichengreen, Barry. 1984. "Experience and the Male-Female Earnings Gap in the 1890s," *Journal of Economic History* 44 (September): 822-34.
- Goldin, Claudia. 1989. "Life-Cycle Labor Force Participation of Married Women: Historical Evidence and Implications," *Journal of Labor Economics* 7 (January): 20-47.
- Goldin, Claudia. 1990. *Understanding the Gender Gap: An Economic History of American Women*. New York: Oxford University Press.
- Goldin, Claudia. 1991. "Marriage Bars: Discrimination Against Married Women Workers, 1920 to 1950." In H. Rosovsky, D. Landes, and P. Higgonet, eds., *Favorites of Fortune: Technology, Growth, and Economic Development since the Industrial Revolution*. Cambridge, MA: Harvard University Press.
- Goldin, Claudia. 1994. "Appendix to: How America Graduated from High School: An Exploratory Study, 1910 to 1960." NBER-Historical Working Paper, No. 57 (June).
- Goldin, Claudia. 1998. "America's Graduation from High School: The Evolution and Spread of Secondary Schooling in the Twentieth Century," *Journal of Economic History* 58 (June): 345-74.
- Goldin, Claudia, and Lawrence F. Katz. 2000. "Education and Income in the Early Twentieth Century: Evidence from the Prairies," *Journal of Economic History* 60 (September): 782-818.
- Goldin, Claudia, and Lawrence F. Katz. 2002. "The Power of the Pill: Oral Contraceptives and Women's Career and Marriage Decisions," *Journal of Political Economy* (August, forthcoming).

- Heckman, James J., and Robert J. Willis. 1977. "A Beta-logistic Model for the Analysis of Sequential Labor Force Participation by Married Women," *Journal of Political Economy* 85 (February): 27-58.
- Korenman, Sanders, and David Neumark. 1991. "Does Marriage Really Make Men More Productive?" *Journal of Human Resources* 26 (Spring): 282-307.
- New York State, Department of Labor. 1919. *Special Bulletin: The Industrial Replacement of Men by Women in the State of New York*. Prepared by the Bureau of Women in Industry, No. 93, March 1919.
- O'Neill, June, and Solomon Polachek. 1993. "Why the Gender Gap in Wages Narrowed in the 1980s," *Journal of Labor Economics* 11 (January): 205-228.
- Phelps, Edmund S. 1972. "The Statistical Theory of Racism and Sexism," *American Economic Review* 62 (September): 659-61.
- U.S. Bureau of the Census. 1975. *Historical Statistics of the United States: Colonial Times to 1970*. Washington, D.C.: G.P.O.
- U.S. Census Office. 1895. *Report on Manufacturing Industries in the United States at the Eleventh Census: 1890 Part I. Totals for States and Industries*. Washington, D.C.: G.P.O.
- U.S. Department of Education, National Center for Education Statistics. 1993. *120 Years of American Education: A Statistical Portrait*. Washington, D.C.: G.P.O.
- U.S. Department of Labor, Women's Bureau. 1934. *The Employment of Women in Offices* by Ethel Erickson. Bulletin of the Women's Bureau, No. 120. Washington, D.C.: G.P.O.
- U.S. Department of Labor, Women's Bureau. 1942. *Office Work in [Houston, Los Angeles, Kansas City, Richmond, and Philadelphia]*. Bulletin of the Women's Bureau, Nos. 188-1, 2, 3, 4, and 5. Washington, D.C.: G.P.O.