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Joyce Burnette & Maria Stanfors

Abstract

This article uses a new and detailed survey of cigar-making employers and employees to investigate male and female wage growth in the late nineteenth century. Swedish cigar workers in 1898 did not have careers like workers today do; instead, labor markets were more flexible, and workers were not much penalized for time out of the labor force. Job tenure was short, and firm-specific human capital was not significant. Women benefited from these flexible labor markets and, unlike today, were not penalized for childbearing. While cigar workers experienced some significant earnings growth, this was confined to the first few years in the industry. Men and women had similar earnings growth at first, but male earnings growth continued longer than female earnings growth, creating a gender earnings gap.

Introduction

To have a career, rather than a job, is to have a long-term relationship with your employer and opportunities for advancement and higher wages. Over the course of a career a worker develops human capital and is promoted through a series of jobs. Jobs have not, however, always had these characteristics; rather, the career is a product of changes that occurred in the labor market during the late-nineteenth and early-twentieth centuries. Nineteenth-century jobs were generally characterized by high turnover and limited wage growth. In response to increases in the need for firm-specific human capital, firms adopted policies designed to reduce turnover. Increases in human capital and delayed compensation policies contributed to greater wage growth for individual workers.

Over the course of the late nineteenth and early twentieth centuries, firms developed the personnel policies that give us the careers we have today. In the US, internal promotion appeared in some industries in the nineteenth century. Railroads were early leaders (Sundstrom, 1988; Howlett, 2004). By 1908 internal promotion was widespread in the US (Sundstrom, 1988). Other changes came in the twentieth century. Turnover fell dramatically in the 1920s as firms instituted policies such as pensions designed to discourage workers from quitting. Workers with greater tenure were rewarded with pensions, vacations, opportunities for promotion, and a lower probability of layoff (Owen, 1995; 2001). In the 1930s personnel departments took from foremen power over hiring, firing, and wage setting (Jacoby, 1985).

Wage profiles support the claim that careers emerged around the turn of the century. Data on nineteenth-century wage profiles is limited, but those that exist suggest that, for adults, wage growth was limited. Burnette (2006) finds that, in England in the 1830s, the wages of both female and male farm laborers were flat during the adult years. Factory workers were more skilled than farm workers, and experienced more wage growth. Boot (1995) finds substantial human capital investment among British factory workers in 1833, and in some industries wages continued to grow until age 30, but older workers had flat wages. Boot and Maindonald (2008) estimate changes over time in cotton industry wage profiles and find that women experienced more wage growth later in the century. On the other hand, Johnson (2003) finds that, in the 1880s and 1930s, wage profiles in British manufacturing were similar to those of 1833. Eichengreen (1984) finds

more persistent wage growth among workers in California; he concludes that female wages initially grew faster than male wages, but that female wage growth was less persistent than male wage growth. Using similar data but a different functional form, Hatton (1997) finds that late-nineteenth-century US workers had rapid wage growth before age 25, but flat wages thereafter. Hatton does not examine gender differences, but it is clear that the model specification seems to be important.

In contrast to these flat wage profiles, the wage profiles of white-collar workers of the early twentieth century do suggest careers. Women, however, experienced slower and less persistent wage growth than men, suggesting that they did not have the same career opportunities. Examining US clerical workers in the 1940s, Goldin (1990) claims that females experienced slower wage growth than males. Examining British bank employees around the turn of the century, Seltzer (2011) finds that, while males and females started at the same salary, male and female earnings profiles diverged as male earnings growth was both greater and more persistent that female earnings growth.

When it comes to wage growth, the theory of human capital accumulation focuses on the acquisition of skills through education and training and how these skills affect worker productivity. Skills are divided into general and firm-specific. The former increase a worker's productivity in multiple firms, whereas the latter increase a worker's productivity within a particular firm. Typically, skills acquired through basic schooling or basic training are classified as general in that they are needed in many different types of employment, but, more importantly for nineteenth century industrial workers, general skills also would include capabilities necessary to function in a particular occupation common among many employers. Firm-specific skills include the ability to operate firm-specific machinery and the knowledge of production processes, and workplace norms that are specific to the firm.

Becker (1962) developed a formal model of human capital investment with respect to different returns to different levels of education. In Becker's original formulation, if workers are free to change employers and move between firms, as definitely is the case in a spot market, and general skills increases their productivity (and earnings) at many workplaces, no single employer would be willing to pay for this training since and the acquisition of general skills since no firm can protect its investment and recoup the cost of training through higher worker productivity. The end result is that firms provide training that leads to

general skills, only if the workers bear the cost of training, typically by accepting lower (training) wages. When it comes to firm-specific skills, the employer may be willing to pay (at least part of) the training cost since the skills acquired are not transferable to other firms. This may result in the firm paying for the training and recouping the costs through future increases in labor productivity. There is always a risk that the worker will leave the firm, and the employer loses the investment, but this risk can be mediated. For example, the firm can try to influence worker turnover by offering higher wages than elsewhere.[1]

This suggests two types of career paths. We expect workers with general skills to have shorter tenure, since they are switching employers more frequently (because their skills are transferable). Moreover, we expect these workers to acquire additional skills by learning from multiple job experiences. For employments requiring more firm-specific skills (that are not transferable), we expect to see higher pay-off to loyalty to the employer, and less labor mobility resulting from stronger attachment between workers and firms.

Historical evidence indicates that firm-specific skills were not very important among nineteenth-century workers. Many workers were unskilled, and most skilled workers had craft skills that could easily be transferred from one firm to another. Turnover was extremely high, partly because workers found it easy to find new employment after they quit (Hareven, 1982: 77, 130). Slichter (1919: 18–19, 34) reports turnover rates of 72 percent at a steel mill, 232 percent in the clothing industry, and 370 percent at Ford. About 1920, however, things changed when firms instituted various policies designed to reduce turnover, a move that Owen (1995) suggests was due to the increase in firm-specific human capital.

These pre-career labor markets seem to have fit women's needs. Since job attachment was not particularly important, women could quit when they needed to spend time at home, secure in the knowledge that they could return to work when they wished. The appearance of careers increased the wage gap, and penalized women for taking time out of the labor force. Hareven (1982: 77–78) notes how employment policies designed to reduce turnover made life for difficult for women:

> As long as the Amoskeag retained its flexible employment policies, women who dropped out for childrearing did not risk permanent loss of a job. Even when a job

[1] These wages should, however, be lower than the value of the worker to the firm. Another way would be to implement employment practices, such as delayed compensation, to increase the workers' attachment to the firm.

was lost in one department, they could always find another job in another workroom. In the 1920s, however, this flexibility disappeared; women found it necessary to return to work as soon as they were able to after childbirth.

Today job displacement leads to permanent income losses for workers of both sexes and women who are able to return to the same employer after childbirth do much better than women who switch jobs (Kletzer, 1998; Waldfogel, 1998). Women need flexible jobs to manage their domestic responsibilities, but in labor markets where firm-specific human capital is important they pay a high price for this flexibility.

This article will show that Swedish cigar workers, though they were skilled, worked in a pre-career job market. The data cover all workers in a gender-mixed industry where men and women worked side by side and undertook the same tasks, and thus are well suited for a study of gender differences and is well equipped to improve on previous studies. We find that job tenures were short, and firm-specific human capital was not important. Most of the wage growth was concentrated in the first few years of experience, and after that wages were flat. Both men and women experienced wage growth, but men benefited more from occupational experience than women. Firm tenure was not important for either sex. This fits well with what has been previously argued, namely that prior to 1900 labor markets were spot markets. This results suggest the Swedish cigar industry in 1898 was part of the pre-career era; turnover was high and wage growth limited. While women experienced less wage growth than men, the flexibility of the pre-career labor market meant that, unlike today, women were not penalized for having children.

The Data

The late nineteenth-century Swedish tobacco industry contained five distinct sections: cigars[2], cigarettes, smoke tobacco, roll tobacco and snuff. Skills and experience were specific to the section, and it is therefore sensible to think of this as five separate industries (Elmquist, 1899: 61). Cigar production was the most important branch, accounting for almost 70 per cent of total employment. Cigar making is a three stage process: preparation work, rolling, and sorting and packaging. Preparation involved handling of the raw tobacco, fermentation, moistening and removing stems.

[2] It should be noted that cigar-cigarettes in the late nineteenth century was regarded as a form of cigar. Later the distinction between cigars and cigar-cigarettes became more pronounced.

Rolling is undertaken either by hand or with the help of a wooden mold. Finally, the cigars were sorted by quality, placed on frames to dry, and packed into boxes.

Swedish cigar production was factory based, with clear division of labor, but was relatively un-mechanized by international standards (Cox, 2003: 124; Elmquist, 1899: 64). Raw tobacco preparation was unskilled work, whereas rolling and sorting were considered more difficult.[3] Rolling required dexterity while sorters needed experience to grade by quality. The traditional training period for cigar makers and sorters was at least two years but the rapid expansion of cigar production and the introduction of cigar making molds shortened the learning process, and made apprenticeship less common by this period (Elmquist, 1899: 96–98; Oakeshott, 1900: 565).

The Swedish tobacco industry was once male-dominated; indeed, in the mercantilist era tobacco manufacturers were only allowed to hire women if no male workers were available. Women entered the industry with the growth of cigar production in the mid-nineteenth century, as in other countries (cf. Abbott, 1907; Galvez Munoz, 2003; Murray & Keith, 2004). In 1898, 70 per cent of the cigar workers were women, similar to the ratio prevailing in the wider industry. Although they made up more than half of all skilled cigar workers, women were less likely to be skilled, only 44 per cent of the women were skilled compared with almost 85 per cent for men. Nevertheless, men and women with similar skills worked side by side within individual factories (Collett, 1891: 460–473; Lindbom & Kuhm, 1940: 38; Webb, 1891: 639). Women could join the cigar-makers' union, but fewer women than men chose to do so.

Concern about economic gender issues in the 1890s led to considerable data collection via surveys and censuses in the US and Europe. As part of this movement, the *Swedish Board of Commerce* instigated a large-scale statistical survey of the tobacco industry in 1898.[4] Henning Elmquist, and three traveling agents, used two sets of questions,

[3] In a similar manner, North American cigar makers were also considered skilled workers (see Cooper, 1987; Prus, 1990).

[4] There were several motivations why the tobacco industry was chosen. First, this industry was known for its conflicts between workers and employers. Second, the tobacco industry had a considerable share of female and child workers. Third, a previous public inquiry on the issue of labor insurances had showed that the work environment in the tobacco industry was particularly unhealthy. Finally, the geographical location of the industry – with its relative concentration to the three largest cities of the country – was thought to simplify the administration of the survey. Other early surveys were made on bakeries and mechanical engineering.

one for employers the other for employees.[5] Employers were asked about the number of employees, their earnings, machinery, working hours, employment contracts and regulations, fringe benefits, experiences of strikes and lock-outs. Workers were asked about the date and location of birth, parents' occupation, civil status, number of children, health status, present occupation, year when entering the branch as well as the present occupation, year when employment at the present factory began, weekly income, wage form, and whether they were union members or subscribers to a benefit society. The ambition was to collect data from all workers employed at the point in time when the agents visited the factory. In total, the agents managed to collect answers from 4,380 tobacco workers, a number very close to the number reported by the employers in the official industrial statistics that year.

We restrict ourselves primarily to cigar workers for whom we have complete data. Since workers report both weekly earnings and hours worked we are able to use hourly earnings as our dependent variable (i.e. the natural logarithm of weekly earnings divided by hours worked during a normal working week). This is particularly useful in the case of gender analysis, since the danger of using weekly wages is that women may be paid less because they work shorter hours. Earnings refer to wage earnings and do not include the value of fringe benefits. This should not, however, be a problem, since benefits were unimportant in the Swedish tobacco industry by 1898. We know whether the worker was paid an hourly rate or a piece rate, but measure the hourly wage as average earnings per hour in both cases.

The dataset also contains a wide variety of personal characteristics including sex, age, civil status, number of children, occupation, skill level, and different forms of experience. Descriptive statistics are shown in Table 1. Men were older than women and more likely to be married. They were more likely to be skilled workers, foremen, and apprentices, and were more likely to be union members. Table 1 also reveals a gender wage gap; on average women earned only two-thirds as much as men.

[5] There was also a third and fourth set of questions concerning working conditions and arrangements for the workers welfare.

Table 1. Descriptive statistics on workers in the Swedish cigar industry, 1898. (a) Men.

	Average	Standard deviation	Minimum	Maximum	N
Men					
Age	33.11	14.94	12	74	864
Age of start of work	14.64	4.75	8	50	864
Years in occupation	18.46	15.79	0	63	864
Year at firm	7.12	10.40	0	63	864
Married	0.39	0.49	0	1	864
Has kids at home	0.35	0.48	0	1	864
Number of children	1.01	1.71	0	9	864
Unskilled	0.11	0.31	0	1	857
Semi-skilled	0.07	0.25	0	1	857
Skilled	0.81	0.39	0	1	857
Foreman	0.02	0.15	0	1	857
Apprentice	0.10	0.30	0	1	853
Union member	0.67	0.47	0	1	864
Paid piece rate	0.81	0.39	0	1	860
Earnings (krona per hour)	0.233	0.109	0.033	0.995	864
- piece rate workers	0.245	0.090	0.035	0.536	697
- time rate workers	0.179	0.157	0.033	0.995	163

Table 1 also reveals evidence of a flexible job market where workers were not strongly attached to a particular firm. Firm tenures were heavily skewed, so that average firm tenure was much higher than median firm tenure. While average firm tenure was seven years for men and five years for women, median firm tenure was two years for both sexes. This is shorter than median tenure today. In 2008 median tenure among US workers was 4.2 years for men and 3.9 years for women (Bureau of Labor Statistics, 2008). Swedish cigar workers changed jobs more frequently than US workers today. While workers did not persist in particular jobs, they

were more likely to persist in an occupation. Median years of experience in the occupation was 16 years for men and 6 years for women. This suggests that, while workers changed jobs frequently, they remained cigar workers for a number of years.

Table 1. Descriptive statistics on workers in the Swedish cigar industry, 1898. (b) Women.

	Average	Standard deviation	Minimum	Maximum	N
Women					
Age	28.60	12.24	13	75	1,900
Age of start of work	18.54	7.09	8	65	1,900
Years in occupation	10.06	10.22	0	50	1,900
Year at firm	5.23	6.93	0	49	1,900
Married	0.17	0.38	0	1	1,900
Has kids at home	0.22	0.42	0	1	1,894
Number of children	0.44	1.03	0	8	1,894
Unskilled	0.36	0.48	0	1	1,892
Semi-skilled	0.16	0.37	0	1	1,892
Skilled	0.48	0.50	0	1	1,892
Foreman	0.003	0.056	0	1	1,892
Apprentice	0.04	0.20	0	1	1,887
Union member	0.31	0.46	0	1	1,898
Paid piece rate	0.75	0.43	0	1	1,884
Earnings (krona per hour)	0.158	0.062	0.034	0.404	1,884
- piece rate workers	0.170	0.062	0.034	0.404	1,422
- time rate workers	0.119	0.045	0.036	0.345	462

Source: *Specialundersökningar Tobaksindustrien 1898*, Statistiska avdelningen, HIII b:1, Kommerskollegiets arkiv, National Archives (*Riksarkivet*), Stockholm.

Empirical Analysis

Age-Earnings Profiles

We begin by examining age-wage profiles. For cigar workers we find profiles that are similar to other profiles estimated for the nineteenth century: wage growth was rapid until the early 20s, after which wages were essentially flat. Male profiles increased more than female profiles before age 25, so adult men earned more than adult women.

While most studies of wage growth use the Mincer earnings function, which assumes that earnings are quadratic in labor market experience, this is not necessarily the best functional form for examining wage growth.[6] Hatton (1997), however, finds that the quadratic spline provides a better fit than the quadratic function for workers in the 1890s.[7] A quadratic spline is basically a piece-wise quadratic function, allowing for different quadratic functions before and after the break point. Murphy and Welch (1990) find that the quartic function provides a better fit than the quadratic or cubic functions for US workers 1963–86. Since the functional form used can have a big influence on the measure of wage growth, this section will compare these various functional forms and determine which best fits the data.

Figures 1 through 4 compare the various different functional forms. Figures 1 and 3 graph wage profiles from quadratic, quartic, and spline functions against a dummy variable specification that includes a dummy variable for each age. The dummy variable specification is too erratic to use for measuring wage growth, but will help us see which of the other specifications is closest to the data. Figures 2 and 4 graph the average residuals at each age from each of the three functional forms. When using the quadratic spline, there is no *a priori* reason for choosing a particular age as the break-point. To choose the break point we estimated twelve different splines, with break points from 17 to 28, and chose the function that produced the best fit (the highest R-squared). For men the break point is age 20, and for women it is age 23. For both sexes the quadratic function

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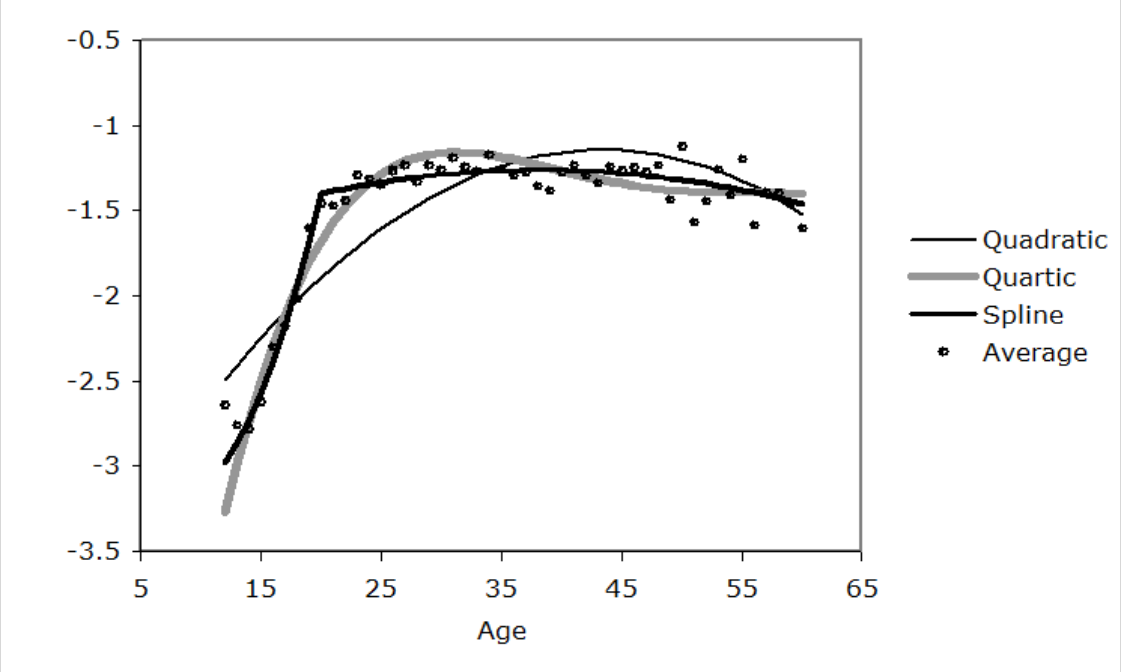
[6] The Mincer earnings function is $\ln w = b_0 + b_1 Educ + b_2 Exp + b_3 Exp^2$, where Educ is years of education, and Exp is labor market experience, calculated as age minus education minus six (see Mincer, 1974).

[7] In fact, Hatton finds that using quadratic profiles led to incorrect conclusions about immigrant assimilation.

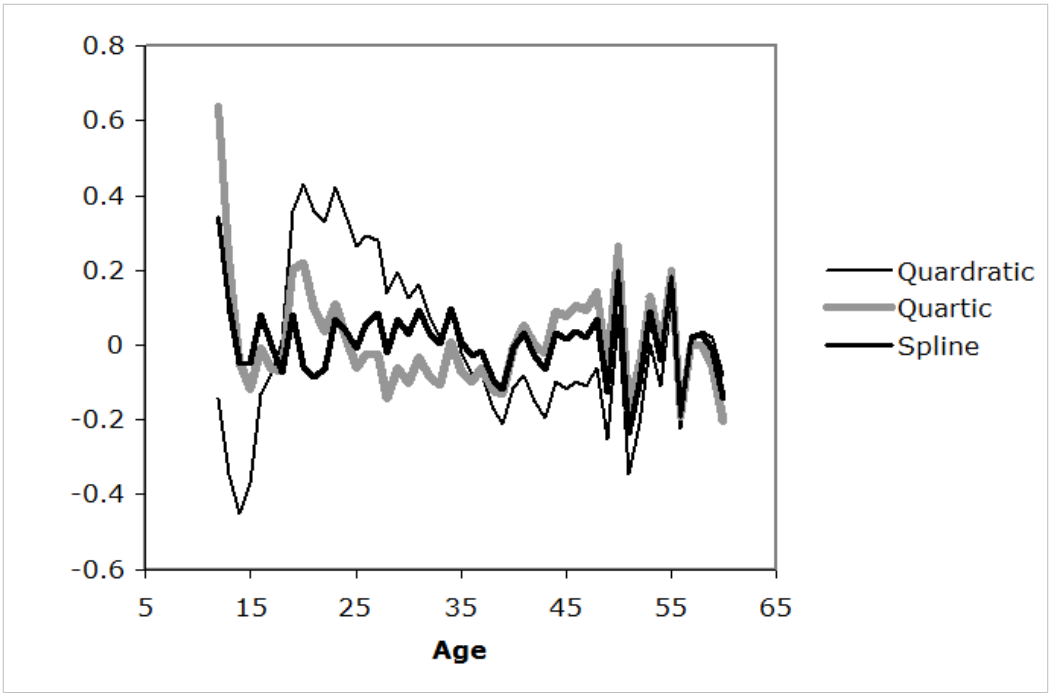
is clearly inferior to the other two functions. The quartic and spline give similar results, but the spline gives a slightly higher R-squared, so that will be our functional form.

Figure 1. Male age-wage profiles, comparisons of functional forms.



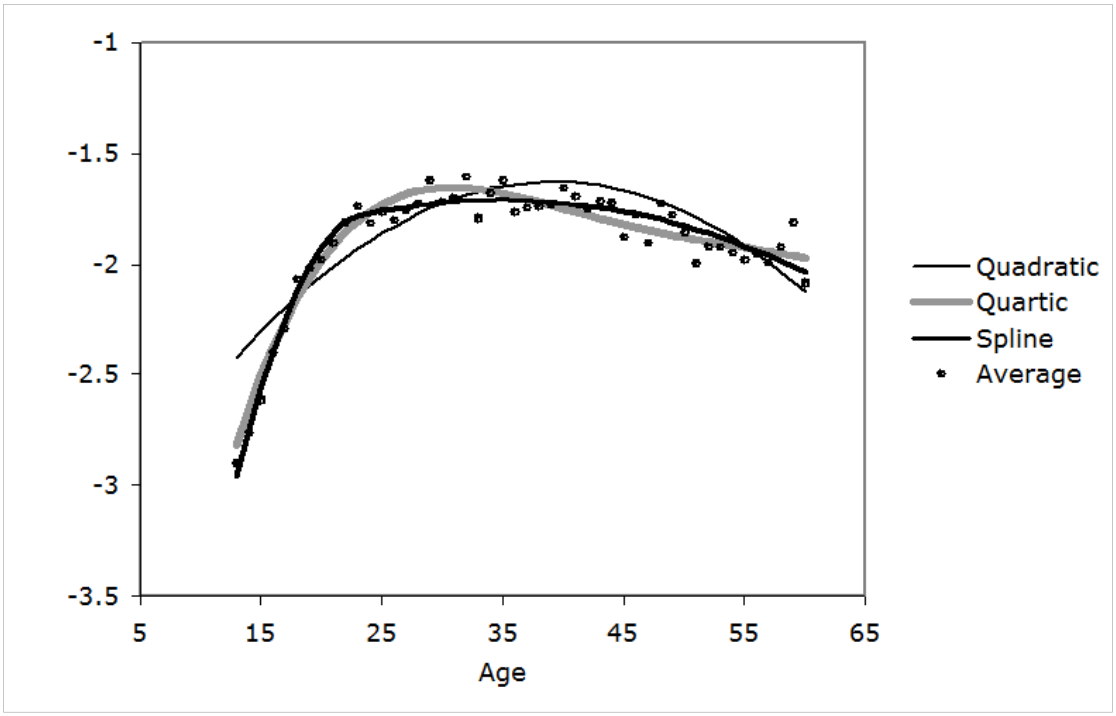
Source: See Table 1.

Figure 2. Residuals from male age-wage profiles, comparisons of functional forms.



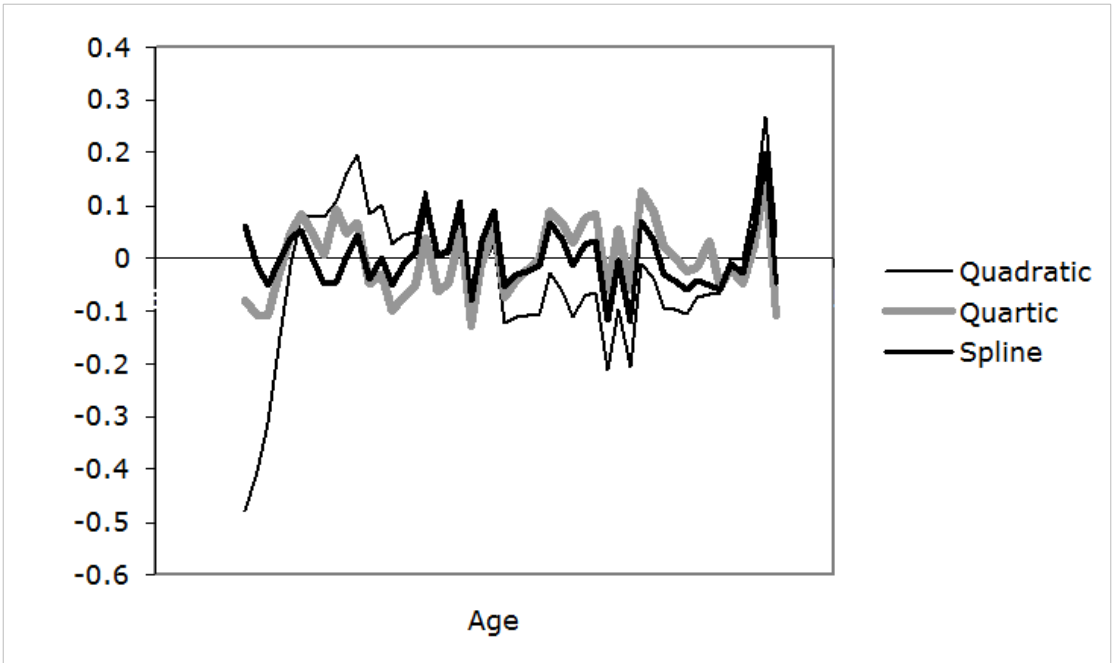
Source: See Table 1.

Figure 3. Female age-wage profiles, comparisons of functional forms.



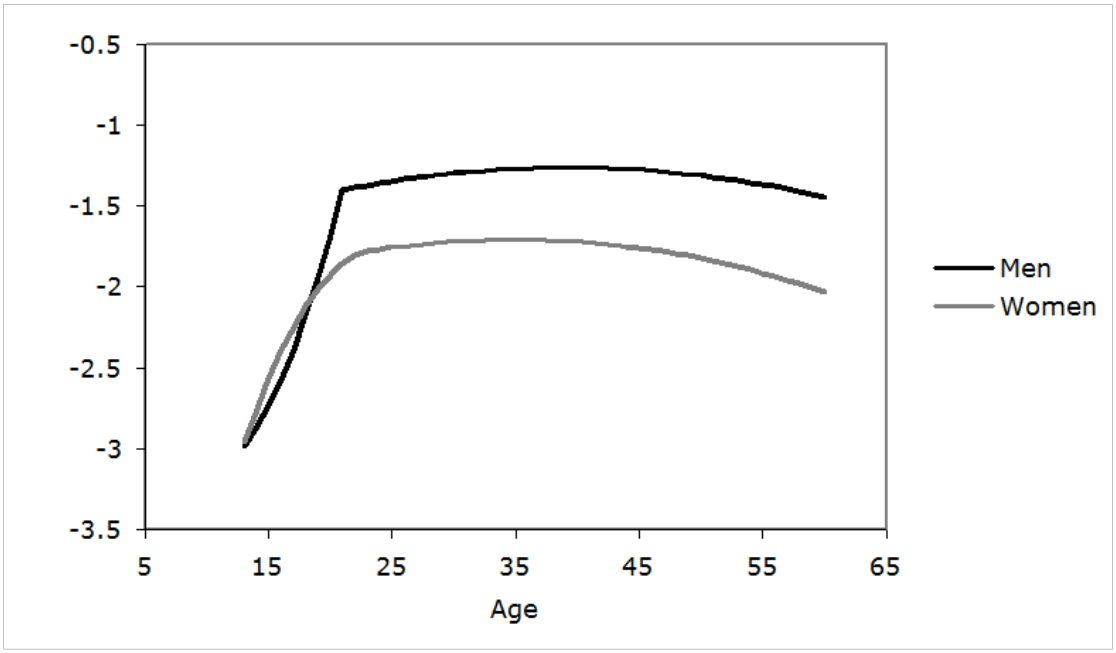
Source: See Table 1.

Figure 4. Residuals from female age-wage profiles, comparisons of functional forms.



Source: See Table 1.

Figure 5. Male and female age-wage profiles.



Source: See Table 1.

Figure 5 shows the spline age-wage profiles for both male and female workers. It shows that women earned slightly more than men up to age 18, but then they fell permanently behind. Between ages 18 and 21 men's wages surged ahead of women's wages. By age 21 women earned only 63 percent of the male wage, and thereafter the gender wage gap remained approximately the same. Neither gender experienced much wage growth after age 21; men's wages rose 15 percent between ages 21 and 39, and women's wages rose 16 percent between ages 21 and 35.

Age-Experience Profiles

Following Mincer, wage profiles are usually estimated as a function of labor market experience rather than age. Since true labor market experience is usually not known, it is usually assumed that workers have been in the labor market continuously since leaving school, and experience is measured as age minus years of education minus six. Our data does not contain a measure of schooling, which was not very important by the time of the survey in 1898, but do include experience variables. While we do not know total labor market experience, we do know the number of years each worker has been in the occupation. Workers may have spent the time before starting in their current occupation at home, in school, or in other occupations, so it would be misleading to assume that a worker's education level is equal to age minus years in the occupation minus six.[8] Instead we will control for the age at which the worker started in their current occupation, calculated as age minus years in the current occupation.

Figures 6 through 9 compare the three functional forms for experience-wage profiles. We tested a range of possible splines, and the functions with the best fit had kink-points at nine years experience for men and at four years of experience for women. Figures 6 and 8 graph the predicted wage for a worker who started in the occupation at age 15, whereas figures 7 and 9 graph the average residual by years in occupation. As above, the quadratic functional form is inferior to the other two, but it should be noted that the quartic and spline functions give similar results. Since the spline function has a slightly higher R-squared, and our focus is on wage growth, we will continue to use that functional form.

[8] The average age of starting in the occupation (age minus years in occupation) is 14.5 for males and 18.5 for females. However, it is unlikely that this indicates that females have on average four more years of schooling.

Figure 6. Male experience-wage profiles, comparisons of functional forms.

Source: See Table 1.

Figure 7. Residuals from male experience-wage profiles, comparisons of functional forms.

Source: See Table 1.

Figure 8. Female experience-wage profiles, comparisons of functional forms.

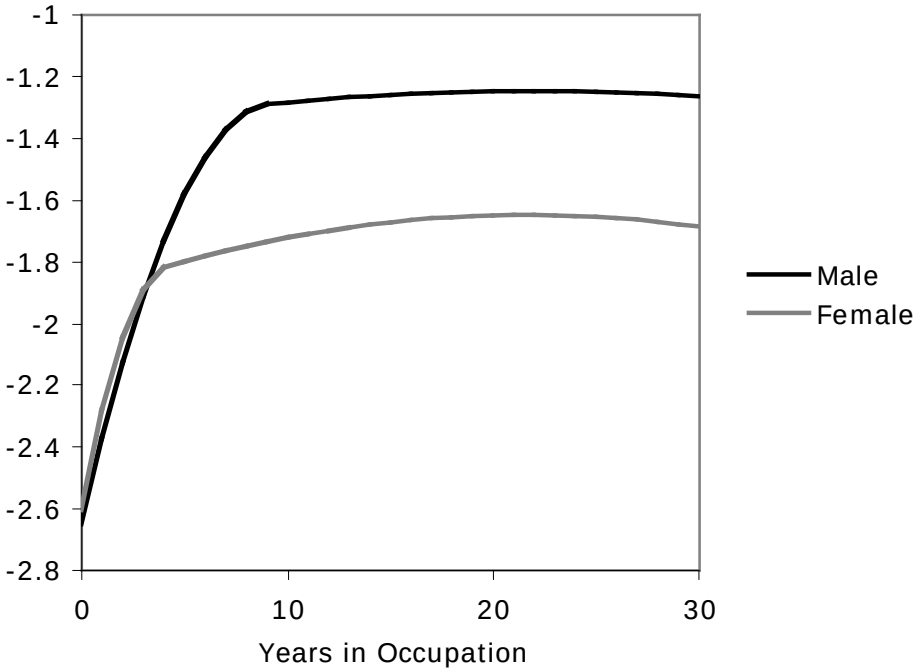
Source: See Table 1.

Figure 9. Residuals from female experience-wage profiles, comparisons of functional forms.

Source: See Table 1.

Figure 10 graphs the gains to occupational experience for men and women. The profiles are quite similar to those in Figure 5. During the first four years both profiles rise rapidly; women gain 20 percent per year and men gain 23 percent. Thus the gender wage gap only appears after four years in the occupation. If we limit the sample to workers with four years or less of experience in the occupation the female wage is actually slightly higher than the male wage: the average male wage is 0.120 krona per hour and the average female wage is 0.122. After four years, however, a gender wage gap appears. Over the next four years men continue to experience rapid growth of 10 percent per year, while women's wage growth drops to 1.7 percent per year. At eight years of experience females earn 65 percent as much as males, and the ratio remains in the 64–67 percent range thereafter.

Figure 10. Male and female experience-wage profiles.



Source: See Table 1.

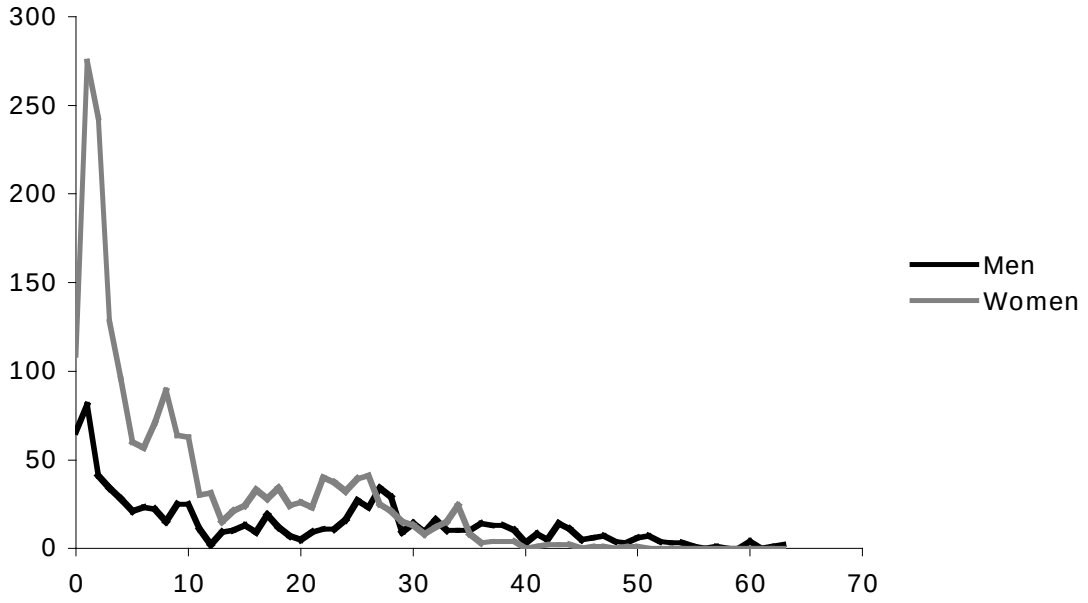
Figure 11. Wage gains from one year of experience.

Source: See Table 1.

Another way to look at wage growth is to measure how much of a wage gain a worker could expect from one more year's experience in the occupation. Figure 11 graphs this gain, measured in log points, against the number of years the worker has been in the occupation already. In the first year women gain slightly more than men, but their wage gains quickly fall to near zero, while men continue to earn more substantial wage gains for their first decade of employment. By the time a worker has been in the occupation ten years, wage gains have essentially ceased for both sexes.

The wage gains observed in Figure 11 could be the result of human capital formation, but they could also be the result of selection. If workers varied in their productivity, and the low-productivity workers dropped out of the labor market in the first few years, then the average wage would rise without any change in the human capital of workers. Figure 12 shows that many workers did leave the industry during their first few years. The drop in numbers was largest for males in the second year (- 49%) and for females in the third year in the industry (- 47%). To the extent that those leaving the industry were less productive than those staying, the wage gain will overstate the human capital gains of those staying in the industry.

Figure 12. Number of workers by year in occupation.



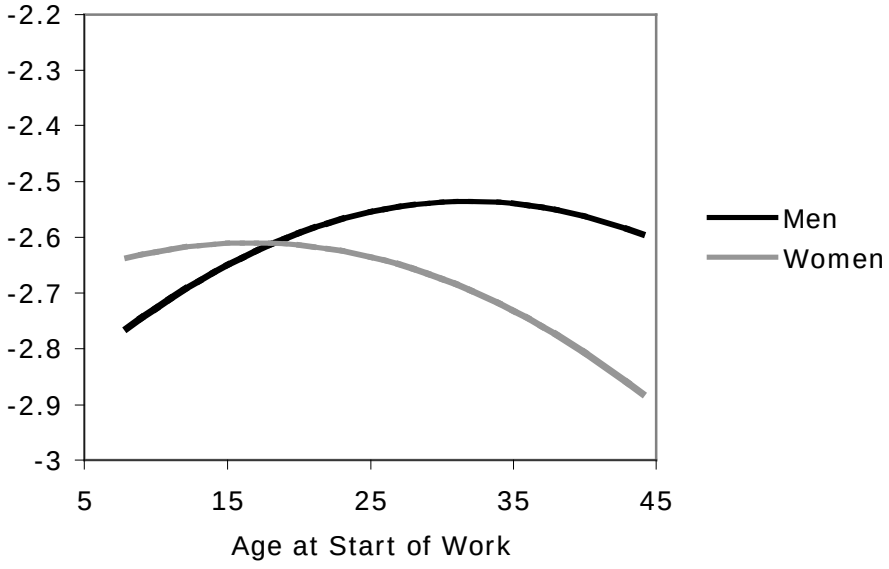
Source: See Table 1.

We conclude that Swedish cigar workers had the same wage growth patterns as other nineteenth-century workers; they had rapid wage growth in the early years, followed by flat wages throughout most of their adult lives. While men and women started at the same wage, female wages stopped growing earlier, creating a gender wage gap.

General Labor Market Experience

While we know the total number of years a worker spent in the cigar industry, we do not know how much general experience they had in other industries before coming to the cigar industry. Since we know the worker's age, we can calculate the age at which they began work in the cigar industry. However, this period of the worker's life contained a variety of activities that would have different effects on the worker's wage. Some of these years were childhood, and some years were spent in school or employed in other industries. Workers may also have been at home engaged in domestic duties or unemployed for part of this time. Table 1 reveals that the average age of starting work in the cigar industry was greater for women than for men. This does not necessarily mean that women had more labor market skills when they began work.

Figure 13. Wage as a function of age at starting work in occupation.



Source: See Table 1.

Table 2. Experience profiles from the Swedish cigar industry, 1898.

	Men	Women	Men	Women
Constant	-2.941* (0.112)	-2.710* (0.056)	-2.936* (0.114)	-2.715* (0.056)
Age of start of work	0.026* (0.010)	0.012* (0.004)	0.025* (0.010)	0.012* (0.004)
Age of start of work squared	-0.0004 (0.0002)	-0.0004* (0.0001)	-0.0004 (0.0002)	-0.0004* (0.0001)
Years in occupation	0.294* (0.021)	0.356* (0.029)	0.290* (0.021)	0.3600* (0.029)
Years in occupation squared	-0.016* (0.002)	-0.040* (0.006)	-0.016* (0.002)	-0.040* (0.006)
Spline	-0.002 (0.022)	-0.018 (0.025)	-0.005 (0.022)	-0.018 (0.025)
Spline squared	0.016* (0.002)	0.039* (0.056)	0.015* (0.002)	0.040* (0.006)
Firm tenure			0.0047 (0.003)	-0.0042 (0.003)
Firm tenure squared			-0.0001 (0.0001)	0.0001 (0.0001)
Kink point of spline	9	4	9	4
R^2	0.66	0.44	0.66	0.45
N	864	1,900	859	1,894

Source: See Table 1.

Controlling for experience in the occupation using the spline function identified above, we tried various functional forms for age at start of work, and none were superior to the quadratic. Figure 13 graphs the relationship between age of starting work and wages, and the first two columns of Table 2 give the regression coefficients. Though girls started at a higher wage than boys, possibly due to their earlier maturation, female gains were always smaller than male gains. The male wage increased with the age of starting work until age 32. For women the wage peaked at age 15, and then declined. This difference may reflect the fact that men and women were doing different things before starting in the cigar industry. Men who started work in the cigar industry at older ages probably spent a great portion of that time working in other industries, where they acquired some general skills. Older women, on the other hand, probably spent many of those years at home. While women performed valuable work during that time, this work did not, however, add to their marketable skills.

Firm Tenure

Our data is particularly rich because we know not only the worker's age and the number of years the worker had spent in the tobacco industry, but also the number of years the worker had worked for the same firm. This allows us to investigate how wages grew with experience in the industry, as well as with tenure at a specific firm. We find, however, that firm tenure provided the worker no additional benefits beyond experience in the occupation. In contrast to current labor markets, workers were not penalized for switching employers.

The last two columns of Table 2 add firm tenure as an explanatory variable. The variable *Years in occupation* includes years spent at the current firm as well as years spent at other firms, so the firm tenure variables measure whether tenure provides any additional benefits beyond occupational experience. If firm-specific human capital is important, then a worker who spent ten years at the same firm should have higher wages than a worker who spent ten years in the occupation and moved firms. If so, the firm tenure variables should have a positive effect on wages. Various functional forms were tried, and none provided any improvement over the quadratic, so a quadratic function is used. Firm tenure does not have a significant effect on the wage. The coefficients are not statistically significant, and a worker who stayed at the same firm was no better off than a worker who moved around.

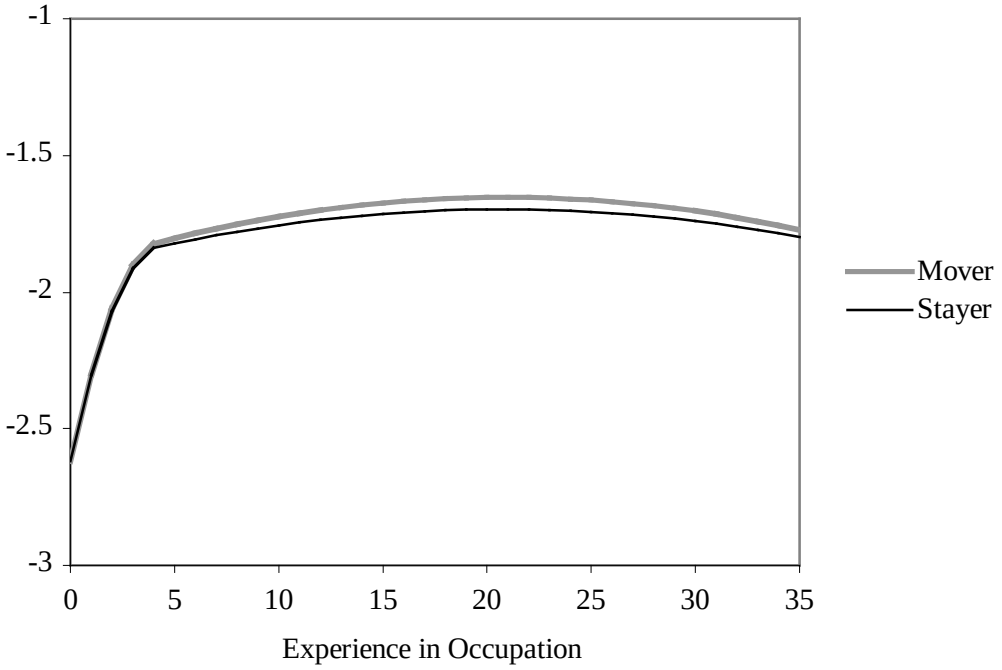
Figure 14 uses the third column in Table 2 to estimate two hypothetical wage profiles, one for a "stayer" and one for a "mover". The stayer starts in a cigar firm at age 15 and stays at the same firm throughout his career. The mover starts in a cigar firm at age 15, but moves to a different firm every year, so that he always has zero firm tenure, even as his experience in the occupation increases. While the stayer's wage profile is above that of the mover, the difference is insignificant. This tells us that the marginal benefit of staying with a particular firm, beyond the benefit of experience in the occupation, was negligible. Figure 15 shows wage profiles for a female mover and stayer. Here also the difference is negligible. While both men and women acquired human capital in their occupation, firm-specific human capital was not important, and workers of neither sex benefited from attachments to a particular firm. The result was that most of the labor force had small amounts of firm tenure. Only 28 percent of women and 35 percent of men had more than five years of tenure at their current firm. Since there was no penalty for changing jobs, it

is not surprising that Swedish cigar workers changed jobs relatively frequently.

Figure 14. Wage-experience profiles for movers and stayers (men).

Source: See Table 1.

Figure 15. Wage-experience profiles for movers and stayers (women).



Source: See Table 1.

Was There a Family Gap?

Waldfogel (1998) suggests that an important reason for the gender wage gap is the "family gap", that is the wage gap between women with children and women without children. While the gender wage gap has been declining over time, the family gap has actually increased. Marriage also contributes to the gender gap. While men receive a premium of 10–15 percent for being married, women do not receive a marriage premium (Waldfogel, 1998: 143, 146). This section will show that the family gap is a product of our current labor market institutions. In the pre-career labor market experienced by the Swedish cigar workers, women did not experience a wage penalty for having children.

In modern labor markets men receive a marriage premium, while women do not. At the same time, women are penalized for childbearing, while men are not. There are three competing explanations for the male marriage premium. Married men might work harder because they feel a responsibility to support their family. Alternatively, if men are positively selected into marriage, then married men would earn more than unmarried men. A third possibility is that married men are more productive because

they benefit from the unpaid domestic services of their wives. The fact the there is a marriage premium for men but not for women points towards the third explanation. Similarly, there are three explanations for the negative effect of children on women's wages. First, there may be selection; if women who choose to have children are less motivated to do well in the labor market, they may have lower productivity. Alternatively, employers may discriminate against mothers and pay them less in spite of equal productivity. A third explanation is that breaks in employment at childbirth have long-lasting effects on women's pay.

Table 3. Effects of marriage and children on women's wages.

	I	II	III	IV
Constant	-2.702* (0.056)	-2.703* (0.056)	-2.700* (0.056)	-2.703* (0.056)
Age of start of work	0.011* (0.004)	0.011* (0.004)	0.011* (0.004)	0.011* (0.004)
Age of start of work squared	-0.0004* (0.0001)	-0.0004* (0.0001)	-0.0003* (0.0001)	-0.0003* (0.0001)
Years in occupation	0.357* (0.029)	0.356* (0.029)	0.357* (0.029)	0.357* (0.029)
Years in occupation squared	-0.041* (0.006)	-0.040* (0.006)	-0.041* (0.006)	-0.041* (0.006)
Spline	-0.016 (0.025)	-0.019 (0.025)	-0.016 (0.025)	-0.016 (0.025)
Spline squared	0.040* (0.006)	0.039* (0.006)	0.040* (0.006)	0.040* (0.006)
Have children at home	0.058* (0.020)		0.018* (0.021)	
Number of children at home		0.016* (0.008)		-0.002 (0.009)
Married			0.099* (0.023)	0.111* (0.023)
Kink point of spline	4	4	4	4
R^2	0.45	0.45	0.45	0.45
N	1,894	1,894	1,894	1,894

Source: See Table 1.

Table 4. Effects of marriage and children on men's wages.

	I	II	III	IV
Constant	-2.901* (0.111)	-2.908* (0.112)	-2.895* (0.110)	-2.893* (0.110)
Age of start of work	0.022* (0.010)	0.023* (0.010)	0.022* (0.010)	0.022* (0.010)
Age of start of work squared	-0.0004 (0.0002)	-0.0004 (0.0002)	-0.0004 (0.0002)	-0.0004 (0.0002)
Years in occupation	0.296* (0.020)	0.296* (0.020)	0.296* (0.020)	0.299* (0.020)
Years in occupation squared	-0.017* (0.002)	-0.016* (0.002)	-0.017* (0.002)	-0.017* (0.002)
Spline	0.003 (0.022)	-0.005 (0.022)	-0.011 (0.022)	0.009 (0.022)
Spline squared	0.016* (0.002)	0.016* (0.002)	0.017* (0.002)	0.017* (0.002)
Have children at home	0.129* (0.029)		0.028 (0.041)	
Number of children at home		0.028* (0.008)		0.008 (0.009)
Married			0.142* (0.041)	0.147* (0.034)
Kink point of spline	9	9	9	9
R^2	0.67	0.67	0.67	0.67
N	864	864	864	864

Source: See Table 1.

The situation was very different from women in the Swedish cigar industry, who were not penalized for childbearing. Mothers earned more than non-mothers, and married women earned more than unmarried women. Table 3 shows the effect of children and marriage on a woman's pay. In contrast to modern labor markets, women with children earn more than women without children, and married women earned more than unmarried women. If continuous employment at the same firm was not important in the nineteenth century, then mothers were not penalized for breaks in employment. The wage effects of marriage and children were similar for men and women, though men received larger premiums. Table 4 shows the effects on males wages. Men received a slightly larger wage premium for being married, while the male wage premium for having children was twice as large for men as for women.

The results suggest more than the lack of a penalty; they suggest that parents actually earned more than non-parents. This requires more

explanation than flexible labor market, and there are a couple of possible explanations. Even when controlling for experience, workers with children may have been older than workers without children. If workers were positively selected into marriage and child-bearing, then these workers would be more productive on average. Additionally, workers with dependents may have been more motivated to work hard and earn more. All of these explanations would apply to women as well as men. Women gained less than men from childbearing, perhaps because childcare diverted more of their energy away from work. Still, women cigar workers of late nineteenth-century Sweden did not experience the family gap that women today do. They benefited from the flexibility of a pre-career labor market.

Concluding discussion

Swedish cigar workers did experience some significant wage growth, but they did not experience wage growth throughout their careers. Most of their wage gains were concentrated in the first few years in the occupation. The human capital acquired was general, and firm tenure did not improve wages. Men gained more than women from general experience in the occupation. These profiles are characteristics of pre-career labor markets, when firm-specific human capital was unimportant. Since firm attachment did not make workers more productive, there were no gains to staying with a particular firm, and firm tenures were relatively low.

In some ways these pre-career labor markets were good for women. Since firm attachment was not important, work was more flexible. Women could take time off for family responsibilities and, while they lost valuable experience in the occupation, they were not hurt by their loss of tenure at the firm. In the modern labor market, women who change jobs as a result of family responsibilities face a permanent loss of wages. While the careers that followed the rise of firm-specific human capital had many benefits, they have proven to be more costly for women than for men, irrespective of country context.

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