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The Evolution of Male-Female Wages Differentials in Canadian Universities: 1970-2001

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Abstract

In this paper, we use a unique data set containing detailed information on all full-time teachers at Canadian universities over the period 1970 through 2001. The individual level data are collected by Statistics Canada from all universities in Canada and are used to analyze the evolution of male-female wage differentials of professors in Canadian universities. The long time series aspect of this data source along with the detailed administrative information allow us to provide a more complete and more accurate portrait of the wage gap than is available in most other studies. The results of a cohort-based analysis indicate that the male salary advantage among university faculty has declined for more recent birth cohorts. This has been driven not so much by an increase in the real salaries of female professors but from a cross cohort decline in the earnings of male professors and the fact that female professors have not experienced a similar cross cohort decline. Also important to note is the fact that the differences across cohorts appear to be permanent. There is no clear pattern of changes in these cohort differences with age.

Introduction

Men earn more than women in most labour markets. There is an extensive literature that uses large cross-sectional data sets to find out how much of the wage gap can be attributed to differences between men's and women's education, experience, hours of work, occupation and other factors (for recent U.S. overviews of the literature see Blau, 1998, Blau and Kahn, 2000, Goldin 2002; for overviews of the Canadian experience see Fortin and Huberman 2002, Baker et al 1995, Drolet 2001, Gunderson, 2006).

The stylized facts that emerge from both the U.S. and Canadian literature are that the gap between male and female wages declined through the 1980s and early 1990s, plateauing in the mid- to late-1990s (Fortin and Huberman 2002, Blau and Kahn 2002). The wage gap is smaller among younger workers than older workers. New cohorts of female workers are entering the labour market with more education and in better jobs than did previous cohorts. Yet as each cohort ages, the wage gap between male and female workers in that cohort grows.

A portion of the wage gap is attributable to differences in education, hours of work, and experience. Institutional factors, such as the extent of unionization, the legislative climate, and occupational segregation, also matter, but their effect is more subtle. For example, the U.S. literature frequently takes as a "stylized fact" that occupational segregation causes male/female wage inequality. However Baker and Fortin (1999) find that, in Canadian data, the femaleness of occupations has little effect on the wages of women. For Europe, Bettio (2002) finds a slightly positive correlation, looking at cross-country data, between the degree of occupational segregation and female earnings.

The ambiguous relationship between occupational segregation and wages points to the importance of labour market institutions and practices. The work of Baker and Fortin (1999) and others (Gunderson, 2006) suggests that women's wages are closer to men in the public sector, and in labour markets characterized by unionization and collective wage setting. Yet conventional data sets, such as the census, provide very limited information about the role of unionization, occupational segregation, or other firm-level characteristics.

This has caused researchers to look to new and less conventional data sets that tell us more about the workings of particular labour markets. Statistics Canada's relatively new Workplace and Employee Survey has allowed researchers to document just how much institutions matter. Drolet (2002: S41), after examining male-female wage differentials using this data set concludes "The workplace accounts for more of gender pay differentials than the worker." Unfortunately, data sets that allow us to examine both worker and workplace are rare. Although the Workplace and Employee survey, as well as others like it, will permit valuable research on gender wage differentials going forward, there are no comparable datasets that allow us to examine historical changes in labour market institutions.

Increasingly economists are making important contributions to the understanding of male-female wage differentials through detailed studies of particular labour markets. For example, an important paper by Goldin and Rouse (2000) examines the switch from "not-blind" orchestra auditions, when the candidate is known to the interviewer, and “blind” auditions, when candidates are initially screened in two ways at once. That is, long-list candidates are screened for a short-list by playing behind a screen, where a candidate’s sound and musical interpretation can be judged, but not his/her gender or other personal characteristics. Goldin and Rouse found that the adoption of blind auditions lead to an increase in the number of female candidates hired by leading orchestras, providing convincing evidence of the importance of gender in hiring. More recently Hamermesh (2006; forthcoming) has used the results of American Economics Associations elections to test for the importance of beauty in electoral success. However this avenue of research has been hampered by the lack of suitable datasets.

We turn our attention to the study of earning differences of professors in Canada. Statistics Canada annually conducts a census of all Canadian academics and collects information on salary, rank, specialization, education, age, gender and institutional affiliation. We essentially have salary data on every Canadian academic over a 30 year period. Although the data set does not have institutional information, the number of institutions in the data set is fairly small, and information on the size, degree of unionization, presence or absence of merit pay, presence or absence of medical schools, and so on, is available from other data sources (Chant, 2006, provides an excellent survey). Because we know that certain universities have merit pay and while others do not we can control for the presence or absence or merit pay by matching people in the survey with their employers’ known characteristics.

Another outstanding puzzle in the literature that we can address with this dataset is the widening of the gender age gap over time. Most researchers have been unable to distinguish between the explanations of the greater wage gap for older workers. The widening-gap explanation suggests that, because men devote more hours to their careers (therefore invest more in human capital), are less likely to take time off for families, are better able to move in response to favourable outside offers and/or are the beneficiaries of discriminatory promotion and retention practices in the labour market, the gap between men and women grows as men move into more senior positions over time. The worse-entry-point effect suggests that the gap between 50 year old men and 50 year old women today is the result of the worse entry point of today's 50 year olds 30 years ago. The worse-entry-point theory suggests that the wage gaps will continue to decrease over time based on currently low wage gaps between young male and female workers; the widening gap theory suggests that not much will change.

The early contributions to the literature on male-female wage differentials in the academy generally used single cross-sections, a short series of cross-sections (Barbezat, 1987, 1991, Broder, 1993) or data from a single university (Ferber and Green, 1982), Lindley, Fish, and Jackson, 1992). Most use U.S. data, however Ward (1999) presents data from a cross-sectional study of five Scottish universities and Blackaby, Booth and Frank (2005) uses data on UK economists collected by the Royal Economics Society. In general, these studies found a smaller wage gap among academics than in the labour force as a whole, in some cases finding no gender wage gap (for example, Formby, Gunther, and Sakano's 1993 study of starting salaries). A general finding is that a sizable portion of the wage gap is attributable to differences in rank and that the gap is greater among older academics (Broder, 1993), although Blackaby, Booth and Frank (2005) suggest that in the UK rank is relatively less important and the availability of outside offers relatively more so. One study (Lindley Fish and Jackson, 1992) argues that women are paid more than men holding constant productivity-related characteristics; the more common finding is that human capital and demographic differences can explain some, but not all, of the remaining wage gap. More recent work in the U.S. has used longitudinal panel data. Ginther and Hayes (2001) and Kahn (1993) use the Survey of Doctoral Recipients while McDowell, Singell, and Ziliak (1999) use a panel survey of American Economic Association members. These studies are consistent with earlier studies, finding that salary differences are largely explained by differences in rank, and women are (generally speaking) less likely to receive tenure and be promoted than are men.

Data and Sample Selection

Data from the master files of the Full-Time University Teaching Staff Data of Statistics Canada over the period 1970 through 2001 are employed in the analysis. This confidential, administrative database is collected each year by Statistics Canada from each of the universities in Canada. It contains detailed information on each employee's salary, type of appointment (e.g. tenure and rank), years since first appointment as well as personal information such as age, gender and education. We restrict the sample to people aged 30 to 65 who were born between 1930 and 1969 for the cohort analysis and use five-year birth cohorts. For example, our first cohort is the 1930-1934 birth cohort and our last cohort is the 1965-1969 birth cohort. We also investigate how the earning differentials have changed over time by using kernel density estimates, counterfactual density estimates and Blinder-Oaxaca decomposition. For this examination, we keep the age restriction, but remove the birth cohort restriction since if we used the subset of data that we use in the cohort analysis, interpretation of the results would be influenced by the aging of the sample.

In Figure 1a, the percentage of university professors who are male and female are plotted from 1970-2001. For this plot, we use the full sample of university professor. In 1970, 13 percent of university faculty were women but this figure has more than doubled to 29 percent by the year 2001. This substantial change in the fraction of faculty who are female means that attitudes towards hiring women may have changed dramatically over the period. If female applicants faced discrimination as part of the interview process at the beginning of our sample period, there is reason to believe that they are less likely to have experienced similar treatment near the end of our sample period. As well, as more women are attaining post secondary education, it is likely that the supply of qualified females has increased. In Figure 1b, the percentage of university professors who are female are shown by cohort. For the earliest two cohorts, a little less than 10 percent of faculty were women. The percentage of university professors who are female increases for each of the subsequent cohorts. Consequently, there is reason to believe that a cohort approach may yield important insight in terms of the evolution of male/female salary differentials across time at Canadian universities.

In Table A1, the summary statistics for some key variables are presented for both men and women. These summary statistics help highlight differences in the key variables between men and women, as well, they are presented for 1970, 1980, 1990 and 2000 so that it is possible to see how these differences have evolved. The average age of the sample increased over the period studied, especially for men, with the average age increasing from around 41 to 50 for men between 1970 and 2000. In 1970, women were on average a little less than 2 years older than men, but by 2000, men were around 3 years older than women. The proportion of females that are either full professors or associate professors also increased over the period studied, from around 28 percent in 1970 to around 61 percent in 2000. The proportion of faculty with PhDs increased over the period studied, particularly for women. Looking at subject taught, there are large differences between men and women, with a much higher proportion of women in nursing and a much higher proportion of men in engineering and applied science or math, physics and other sciences. The relative overrepresentation in these fields stayed fairly constant over the period studied.

In Figures 2 through 8, Kernel density estimates are presented for the salary distributions for male and female professors at Canadian universities. The mean earnings for males are shown by the vertical dashed line and for females by the vertical straight line. In each case, the underlying salary data has been normalized to be in year 2001 Canadian dollars. For each year, the estimated distribution for men generally lies more to the right than the distribution for women indicating higher average earnings for men. However, there does not appear to be a clear pattern across time in terms of the differences between these distributions. In general, the distributions seem very similar across time with the one exception that both the male and female salary distribution for university professors appears to widen slightly over the 30 year period, particularly in the first ten years of the period.[1] The greater variance in earnings may be partially due to an increasing emphasis on individual ability and/or performance in wage-setting for university faculty.

The kernel density estimates for the full 32 years are plotted in Figures 9a and 9b. For males (Figure 9a), the densities are tight in the first few years, but widens over the survey period. The density of females also spreads out over time for females, but not to the same degree as that found for males. It is difficult to determine how different these densities are visually comparing Figures 9a and 9b.[2] To better enable the visual comparison of these densities, the differences between these two graphs are plotted in Figure 9c. The region above zero represents the area on the distribution where the male density is greater than that of females and points below zero represent the area where the

[1] We also reran these estimates using the same restriction as is used in the cohort analysis (born between 1930 and 1969). We found that this effect is much more pronounced since as the years of the sample progress, the earlier cohorts are aging while newer cohorts are entering which creates more variance in age in the later years and consequently we see more variance in earnings.

density of females is greater. This graph clearly shows that the bulk of the female density is to the left of the male density. To help examine Figures 9c, the differences in the densities for every ten years are shown in Figure 9d. We reran the results from Figure 9d, restricting the sample first to ages 30 to 39 (Figure 9e) and then ages 50 to 59 (Figure 9f). The differences in the densities are shrinking over the time period studied as the female earnings distribution converges towards the male earnings distribution for both of these samples. As well the difference in any given year is smaller for the 30 to 39 sample than for the 50 to 59 sample.

In Figures 10, 11 and 12, age-earnings profiles are presented based on the estimates of a cohort model of faculty salaries. The approach is common in the literature (see for example, Beaudry and Green, 2000). In order to allow for an evolution in the labour market entry earnings and earnings growth of university professors from different graduating periods, we allow earnings to vary according to the birth cohort of the individual.[3] The cohort approach allows us to take a first pass at evaluating the two competing explanations of the larger wage differential between older men and older women described in the introduction: the widening gap hypothesis (which explains the increasing differential in terms of more rapid male career progression and more rapid male salary growth) versus the worse starting point hypothesis (the larger gender wage differential for older individuals reflects the lower initial salaries earned by women who are now in their 40s, 50s and 60s).

[2] Using the Kolmogorov-Smirnov test, equality of the female and male distributions is rejected in each year at the one-percent level.
[3] An alternative would be to allow for the earnings profiles to vary by the year in which the individual received his or her highest degree.

The earnings equation used to generate these figures has annual earnings as the dependent variable. On the right-hand side are a set of dummy variables for the birth cohorts that appear on their own and as interactions with both age and age-squared. This specification allows for separate initial salaries as well as separate earnings growth patterns by age across the different birth cohorts (separately by gender).

In Figure 10, there is no clear evidence of a shift in the age-earnings profile of women across birth cohorts.[4] Neither the starting salaries nor the growth in earnings of women seems to have changed across cohorts. This might initially be interpreted somewhat negatively as a lack of progress for women in academia. However, when Figure 10 is compared with Figure 11, we see that women's earnings in academia have improved relative to those of men. Starting from the well-salaried 1930-34 cohort, male earnings gradually fell in real terms through to the 1955-59 cohort. In Figure 12, the differences between the male and female age-earnings profiles are presented by birth cohort. We see that there has been a gradual narrowing of the male-female earnings differential across birth cohorts. Only for more recent cohorts has the salary differential widened again.

One explanation for the widening wage gap in recent years may be that men make up the majority of new hires in relatively well-paid fields such as engineering or economics, whereas women are increasingly dominating the relatively less remunerative fields of English or Anthropology. In Figures 13 and 14 we investigate this possibility by repeating the cohort regression analysis separately by broad field grouping then plotting

[4] Restricting the age earning profiles to be equal for all cohorts, we find that the male cohort dummies are jointly statically significant with an F-statistic of 317.08. As well, repeating the same test for females, we also find that the female cohort dummies are jointly statistically significant with an F-statistic of 6.58.

the estimated male/female differences in earnings by birth cohort. Typically, the gap between male and female earnings is smaller if one looks at a more narrowly defined occupational group; however, this is not what we find in this part of the analysis. The differences in earnings between males and females in health, shown in Figure 13, are greater than the overall differences from the earliest cohorts until the 1955-59 cohort, presumably reflecting the conventional wisdom that ‘men are paid more than women because men are doctors and women are nurses’. In Figure 14, we again see large earnings differences between male and females in sciences and engineering. It is important to bear in mind, however, that these initial runs are for a very widely defined sample, so we may be including a number of low-paid female lab technicians in our sciences and engineering numbers, which will skew average female salaries downwards.

Because the age-earnings profiles in Figures 10 through 14 overlap so extensively, it can be hard to get a sense of how salaries are changing over time for academics at a given career stage. Figures 15 through 20 are presented to give a sense of how earnings are varying over the survey years by age group (which is equivalent to comparing across birth cohort curves for the same age). We see a slight u-shaped trend in early-career salaries for both men and women, and a gradual decline across survey years in the salaries of older professors, particularly older men. Given that academic productivity does not appear to increase with age (indeed Oster and Hamermesh, 1998, in an interesting study, argue that it decreases substantially), and most academic salary structures are seniority based, giving pay increases with age, the aging of the professoriate hired in the rapid expansion of the university sector in the 1960s would be expected to put considerable fiscal pressure on universities. It would not be surprising to see universities responding by limiting the increase in salaries of more expensive faculty – especially as the number of faculty in these age groups increases.

This discussion raises an important issue: salaries at universities are generally set through a collective negotiation process, whether through a union or through a non-union faculty association. As discussed in the introduction, institutional factors appear to influence strongly the size of the difference between male and female earnings. To explore the importance of this difference, we begin by examining the difference in earnings between males and females at merit-based universities and seniority-based universities, using the categorization of universities in Chant (2006).

The cohort models are re-estimated over the sub-samples of universities with merit-based salary determination systems and those with seniority-based salary determination systems. The predicted male-female earnings differences by age and cohort are presented separately for the two sets of universities in Figures 21 and 22. The male-female salary gap is smaller where there is a stronger collective wage determination process - in the seniority-based universities. It is interesting that the difference in earnings between males and females in merit-based universities declines from about age 45 onwards. This may be because of higher-paid males hitting salary ceilings beyond which merit elements are reduced, and the negative effect of family on women's merit-based achievements during the peak child rearing years. Unfortunately, since the data do not include information on number of children or marital status, we are unable to explore these possibilities.

The analysis to this point has controlled for factors such as age, cohort, gender and at least some characteristics of the university. In the next stage of the analysis, detailed controls on the individual professor are introduced in order to see if the results reported above are sensitive to their inclusion. In particular, some of the cross cohort patterns observed may be due to changing average demographic characteristics across cohorts of university professors that have an impact on faculty earnings. The variables included in the analysis are controls for the rank, broad field, highest degree, country in which highest degree was awarded and country in which first degree was awarded.

In Figure 23 and 24, age-earnings profiles by birth cohort are presented for male and female professors, respectively. The profiles are generated for the case of a full professor in a Social Sciences field with a Ph.D. who received his/her first degree and highest degree in Canada. The general cohort pattern is similar to what was found earlier when these controls were not included. Pronounced cohort declines are found for male professors. The cross cohort pattern is apparent for female professors; however, the magnitude of these differences is much smaller. In Figure 25, the male-female earnings differences are plotted by age and birth cohort. The cross cohort decline is apparent; however, the magnitude of these differences is fairly small at less than $7,000 per year and much smaller in most cases.

This analysis was also repeated with a full set of university fixed effects included in order to see if the cross cohort variation may be picking up systematic differences in salaries across institutions. Figure 26 is generated using the results of these cohort models with both the demographic controls variables and the university fixed effects. The patterns are very similar to those of Figure 25 indicating that variation across universities in wage setting does not appear to be driving these cross birth cohort differences in earnings between male and female faculty members.

In Table 1, the percentage of the earnings differences the controls account for are displayed by cohort. This is calculated at age 36, since this is the only age that we have information for all cohorts. For most of the cohorts, the observable characteristics account for much of the earnings difference between male and female professors, accounting for more than half for most cohorts and over 80 percent of the male-female earnings difference for the 1945 and 1950 cohorts. The addition of institutional fixed effects does not account for any additional amount of the male-female earnings difference.

Dynamic Blinder-Oaxaca Decomposition

Next we use the Blinder-Oaxaca decomposition to break down the earnings differentials into explained and unexplained portions and these are presented in Figure 27a. We control for age, rank, broad field, highest degree, country in which highest degree was awarded and country in which first degree was awarded. The explained portion is measured as differences in endowments, while the unexplained portion measured as differences in coefficients. The top of the each bar graph shows the total earnings differential between men and women in a given year. The earnings differential between men and women tends to be dropping over time. The light portion of each bar indicates the amount of the earnings differential that can be explained by differences in endowments, while the dark portion of the each bar shows how much of the difference is left unexplained by observable characteristics. The majority of the earnings difference can be explained by differences in the characteristics between men and women. The percentage of the earnings differential that is explained is shown in Figure 27b. Between around 60 and 80 percent of the earnings difference can be explained, although, it is likely that differences in observable factors that we could not control could also account for further differences. There also appears to be an upward trend in the amount of the earning differential that can be explained over the period studied.

In Figure 28a, we reran the Blinder-Oaxaca decomposition, but this time added institutional fixed effects. The amount explained, again shown by the lighted shaded portion of the bar, increases over the period studied. The percentage of the earnings differential explained is similar with or without the institutional fixed effects.

Counterfactual Densities

While difference in mean earnings and conditional earnings are important, the differences in the distribution of the earnings are also important. Earlier in the paper, the earnings distributions of females and males were examined. Here we try to examine the impact that different observable characteristics have on the difference between the earnings distribution of females and males by looking at counterfactual density estimates. We do this by re-weighting the males earning function to take into consideration the observable characteristics of females. This gives a counterfactual estimate of what the female earnings distribution might have looked like had they been paid based on the males earnings function. If no difference exists between the female and the counterfactual density functions then this would imply that females are not paid any differently than males but that they have different observable characteristics. If the counterfactual distribution is identical to that of the male distribution, then women have identical observable characteristics but all of the differences in the earnings distributions are due to differences in how the university labour market rewards these skills. Looking at figures 29 through 35, the counterfactual density estimates lie between the male and female density estimates which implies that the part of the difference in the female and male density estimates are due to differences in observable characteristics and part of the difference is due to differences in pay based on observable characteristics. However, it should also be noted that these differences might also be due to differences in unobserved heterogeneity or differences in variables that are not controlled for as part of the analysis.

The difference between the female densities and counterfactual densities for every ten years is plotted in Figure 36a. If there are no differences between the female and counterfactual densities and so distribution differences are based on differences in observable characteristics, then we would observe a horizontal line. The difference between the two distributions over the entire sample period is displayed in Figure 36b. Again, we have the same interpretation, we would view a horizontal plane if there were no differences in pay between men and women but instead, the differences in the distributions were based on differences in observable characteristics. It appears that the difference in the distributions are flattening out and shifting to the right overtime. In figures 36 a2 and 36 a3, the difference between the counterfactual estimates and the female earning densities are plotted for the 30 to 39 and 50 to 59 age groups. The portion of the distribution difference that is due to differences in how characteristics are rewarded seems to shrink over the period studied, particularly for the 30 to 39 age group.

Conclusions

Female professors in Canada have lower earnings on average than their male counterparts. The results of a cohort-based analysis indicate that gender differences in salaries have declined over time. This has been driven not so much by an increase in the real salaries of female professors but from a cross cohort decline in the earnings of male professors and the fact that female professors have not experienced a similar cross cohort decline. Also important to note is the fact that the differences across cohorts appear to be permanent. There is no clear pattern of changes in these cohort differences with age.

This overall pattern is robust to a number of changes in specification and the use of different sub-samples of professors. The magnitude of this cross cohort declines in the male/female earnings differences were especially large in the Health field and in the Sciences and Engineering; however, the overall patterns were very similar to those found when the entire sample of university professors was employed.

The analysis was also carried out separately over the sample of universities with merit-based remuneration systems and those with seniority-based remuneration systems. The magnitude of the cohort differences was found to be larger in the merit-based system for faculty members under the age of 50. For older faculty members the male-female difference declined with age.

The introduction of controls for rank, education, country of highest degree and country of lowest degree did not lead to qualitatively different results. The results were also unaffected by the introduction of university fixed effects. The Blinder-Oaxaca decomposition indicates that the majority (between 60 and 80 percent) of the earnings differential can be explained by differences in observable characteristics that we could control for.

The differences between the male and female earnings distributions were also examined and it was found that the earnings distributions were different in each year. Examining counterfactual density functions, it was found that part of the difference in the earnings distributions could be attributed to differences in observable characteristics, while the other portion is due to differences in pay.

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Figure 1a
Gender breakdown of professors in Canada, 1970-2001

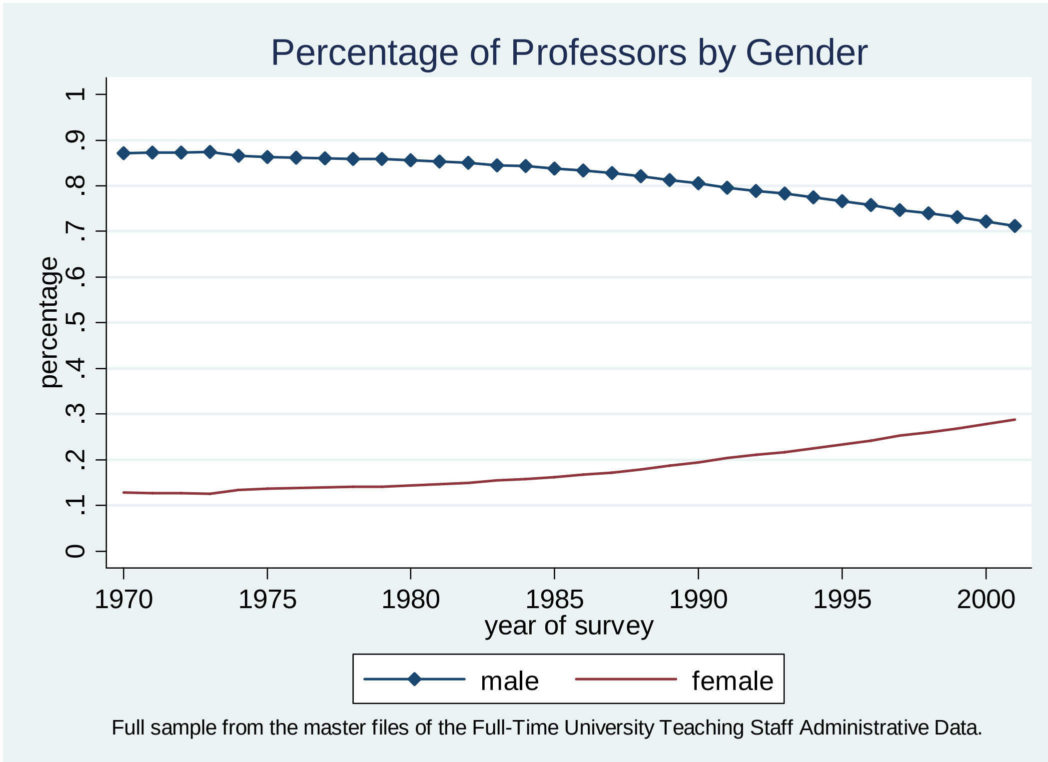


Figure 1b

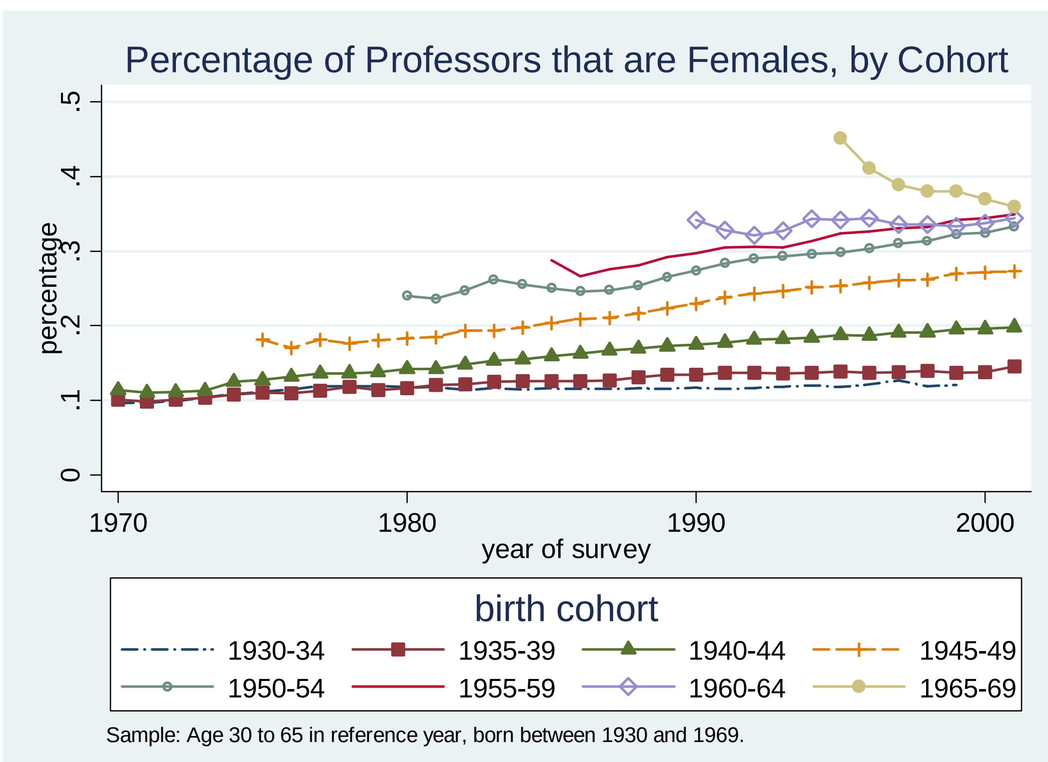


Figure 2

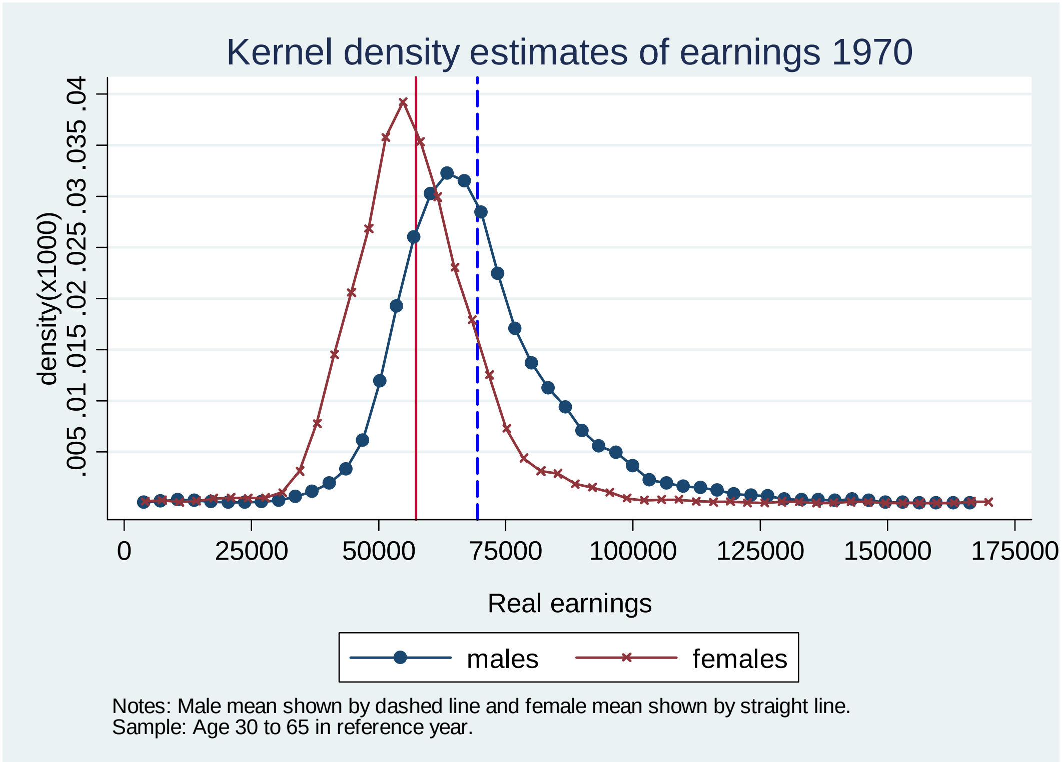


Figure 3

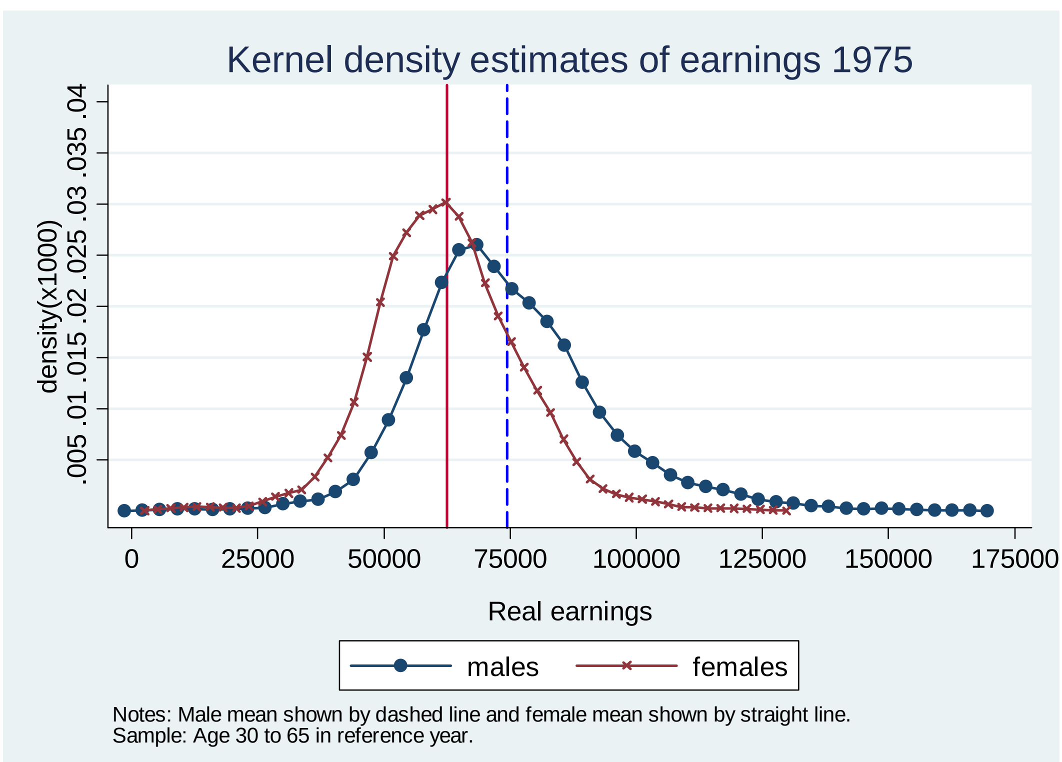


Figure 4

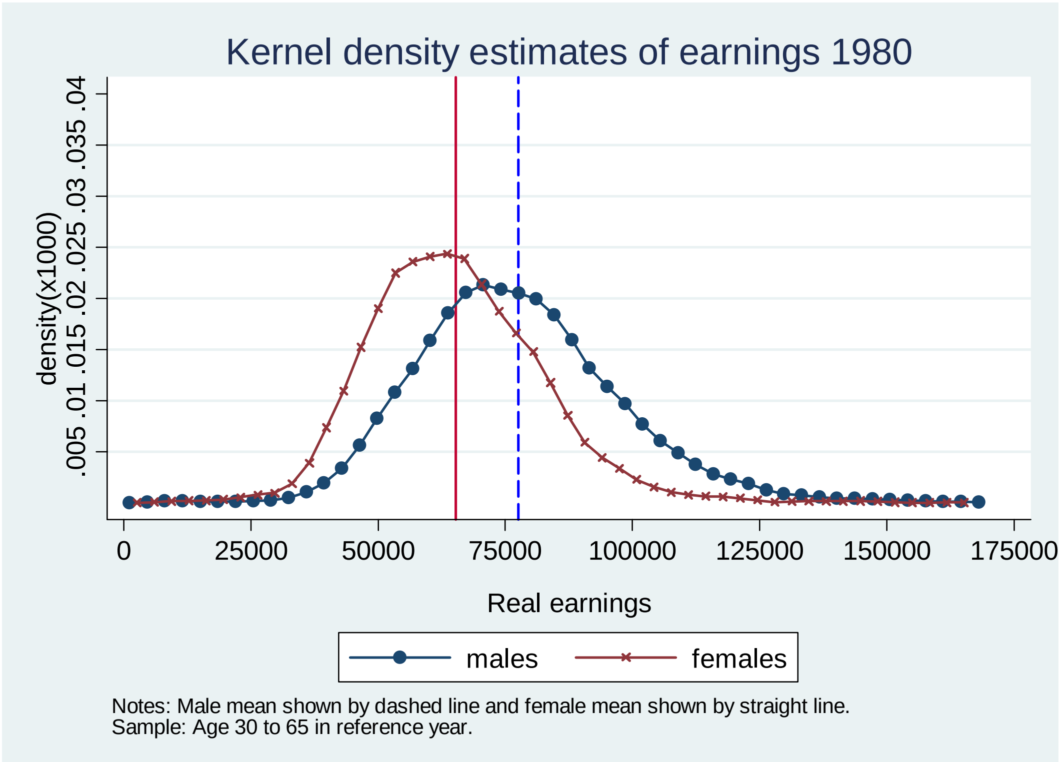


Figure 5

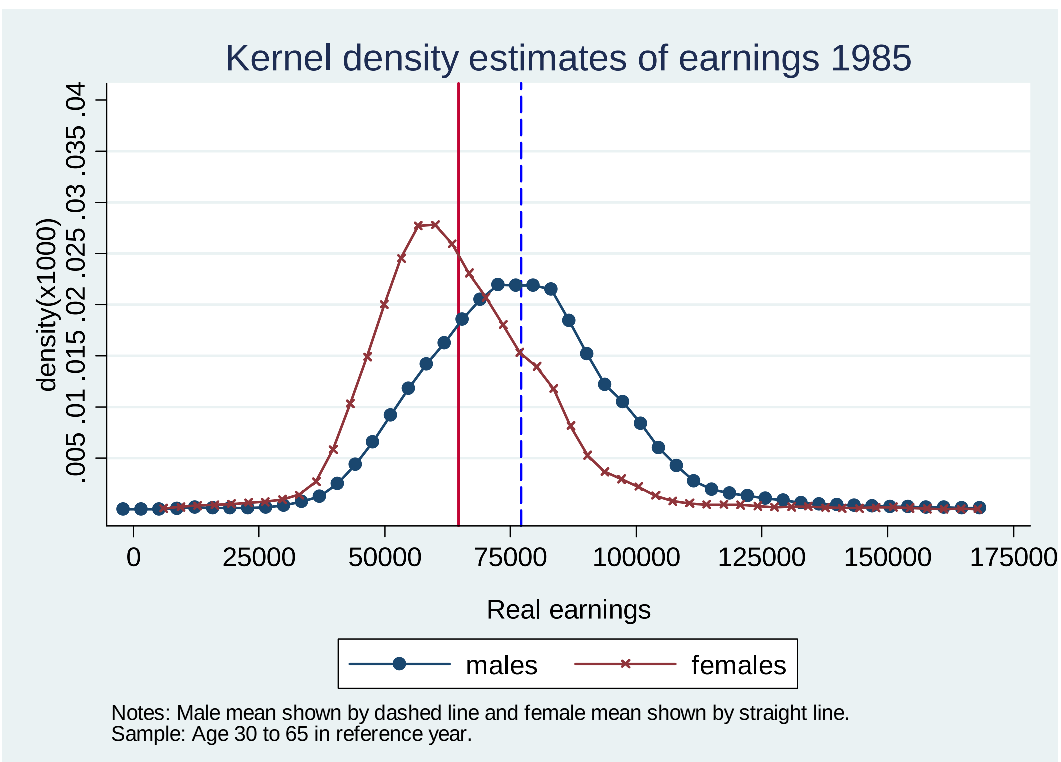


Figure 6

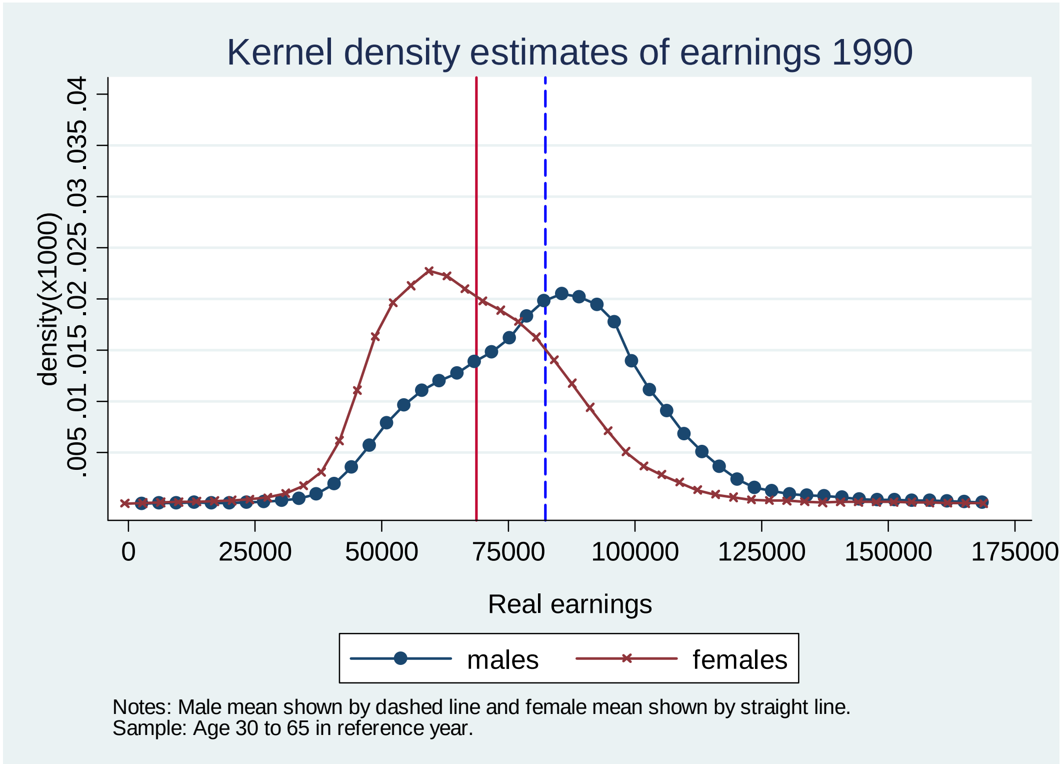


Figure 7

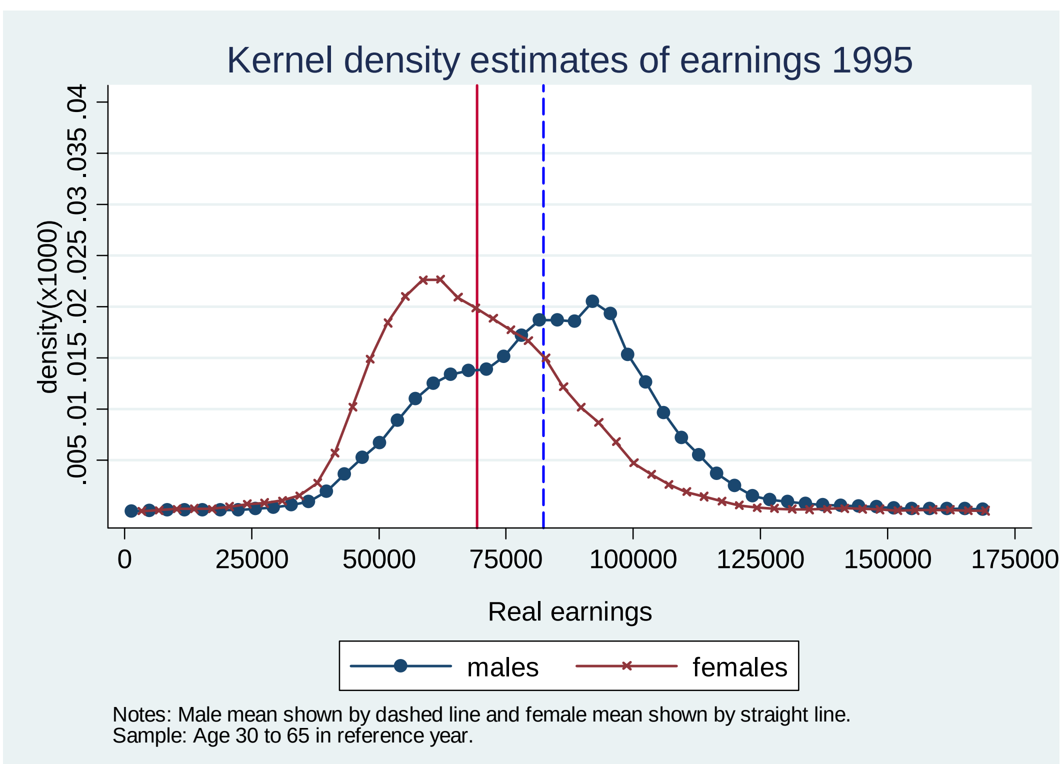
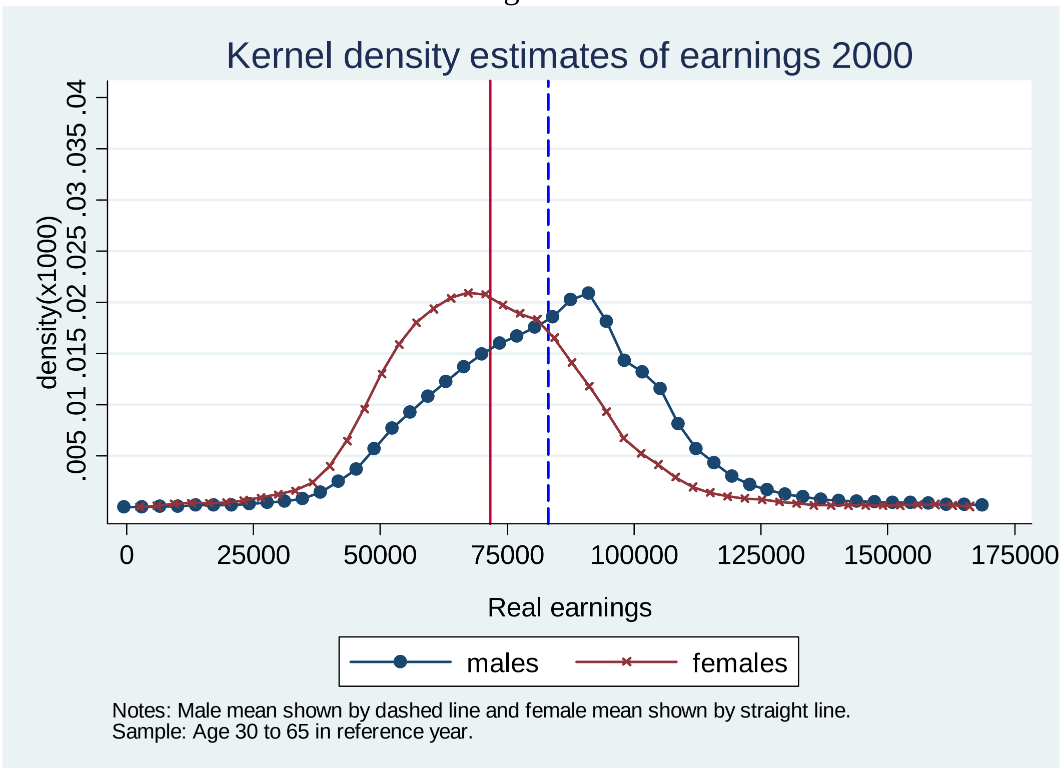


Figure 8


Kernel density estimates of earnings 2000
density(x1000)
.005 .01 .015 .02 .025 .03 .035 .04
0 25000 50000 75000 100000 125000 150000 175000
Real earnings
males
females
Notes: Male mean shown by dashed line and female mean shown by straight line.
Sample: Age 30 to 65 in reference year.

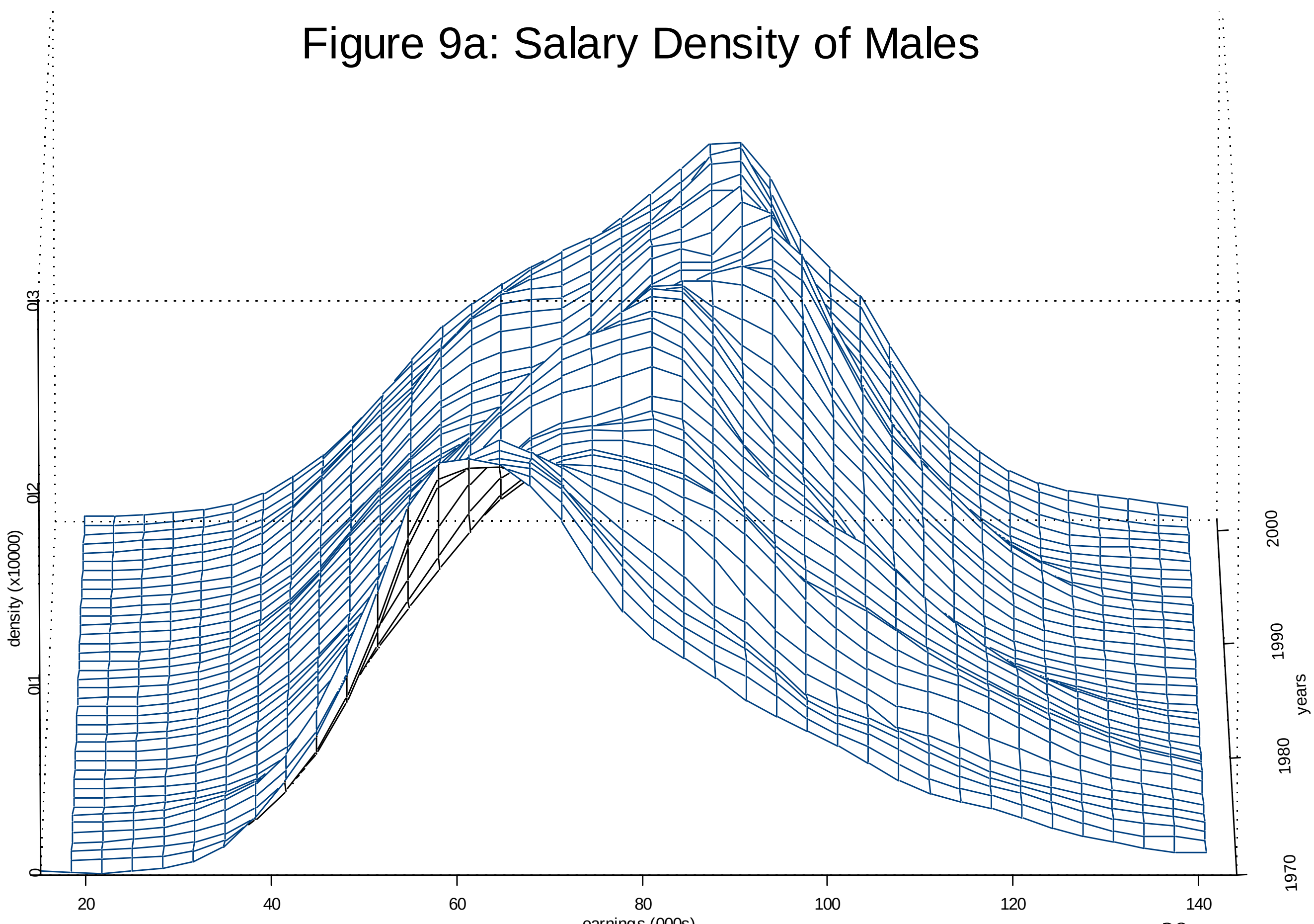


Figure 9a: Salary Density of Males
density (x10000)
0
.01
.02
.03
20 40 60 80 100 120 140
earnings (000s)
years
1970 1980 1990 2000

Figure 9b: Salary Density of Females

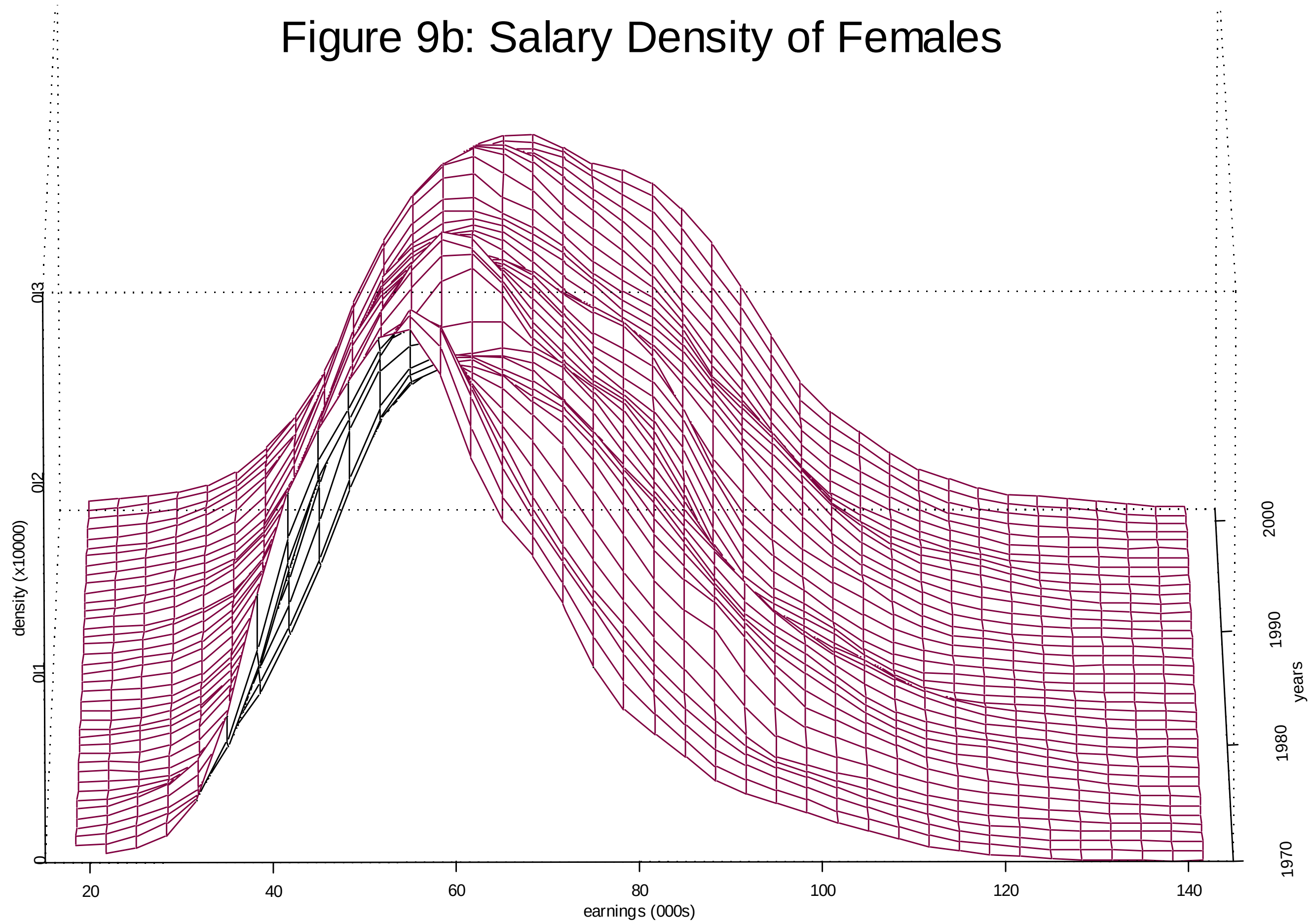


Figure 9c: Difference in Male/Female density

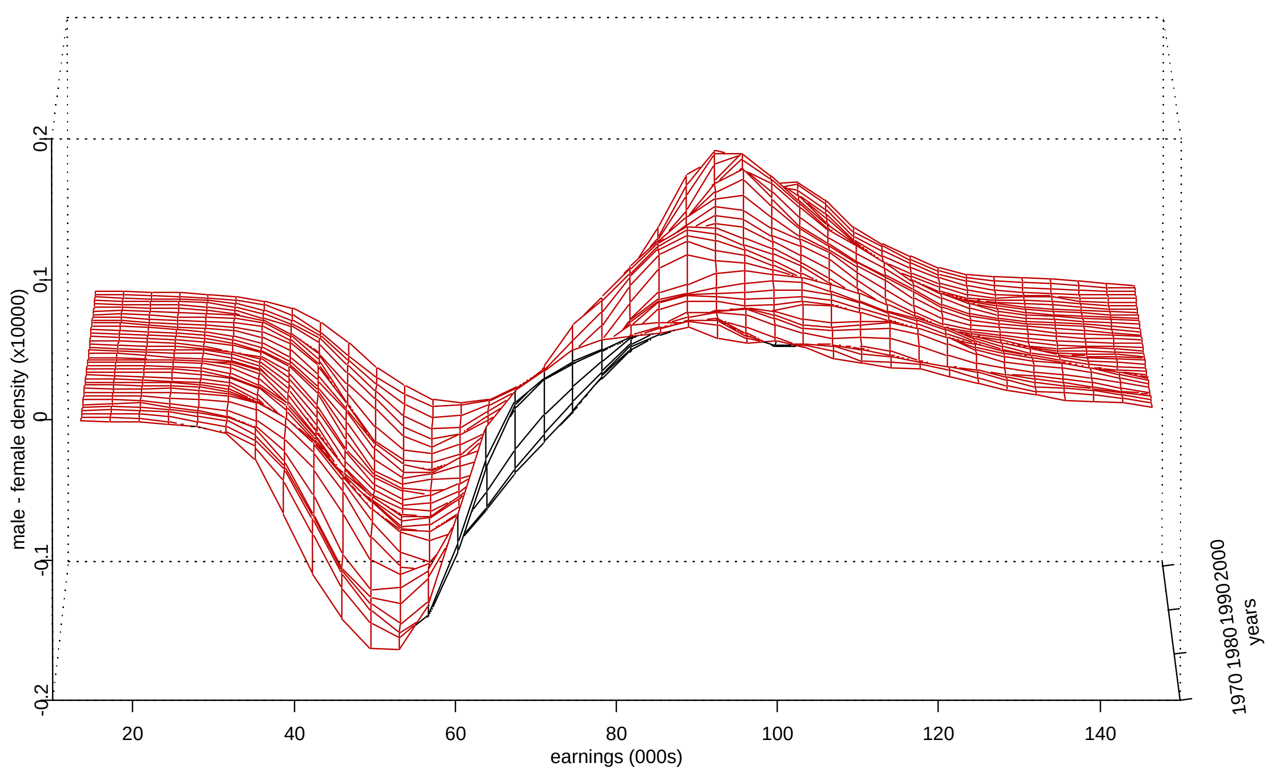


Figure 9d

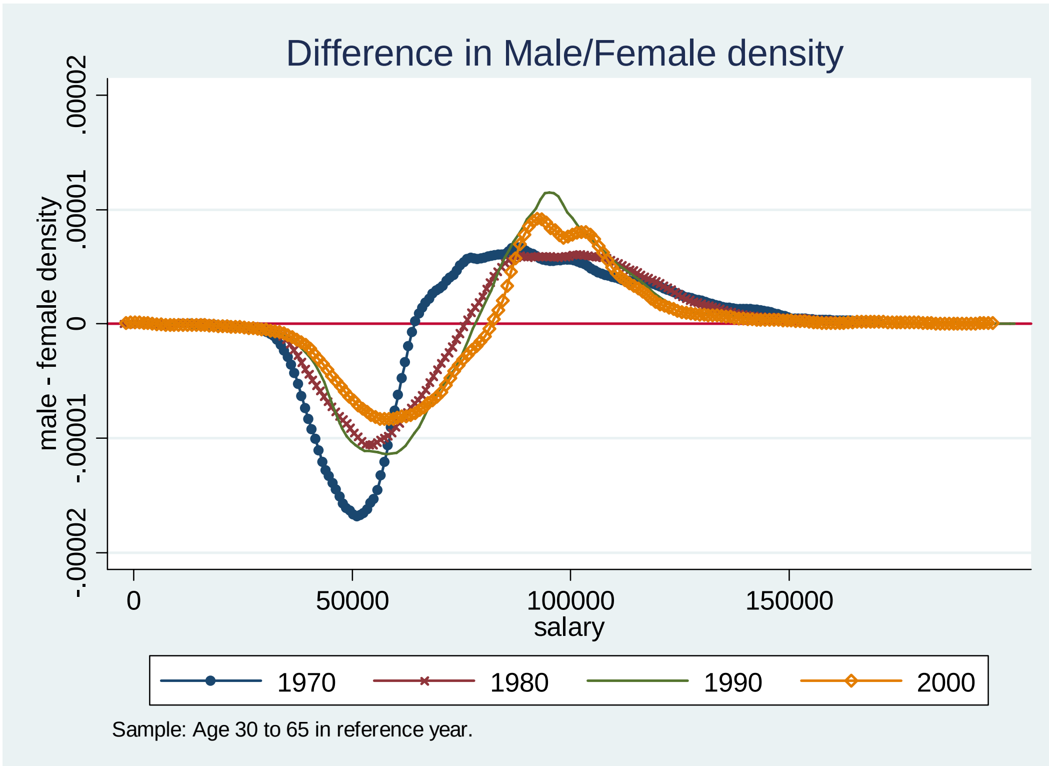


Figure 9e

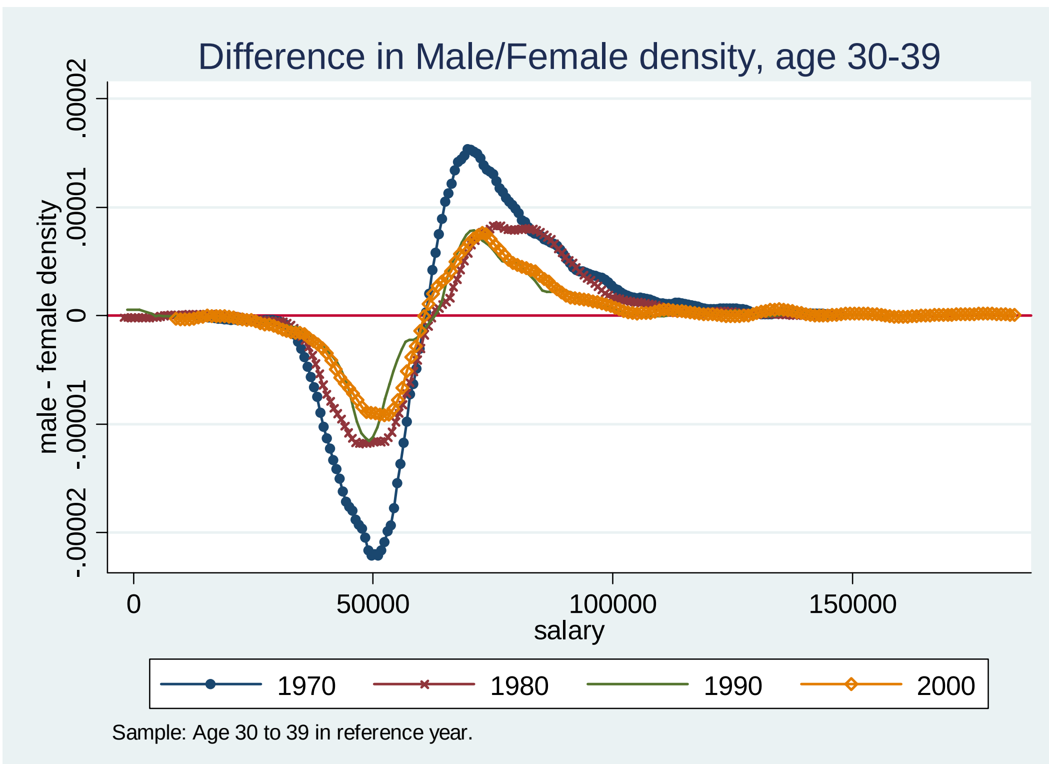


Figure 9f

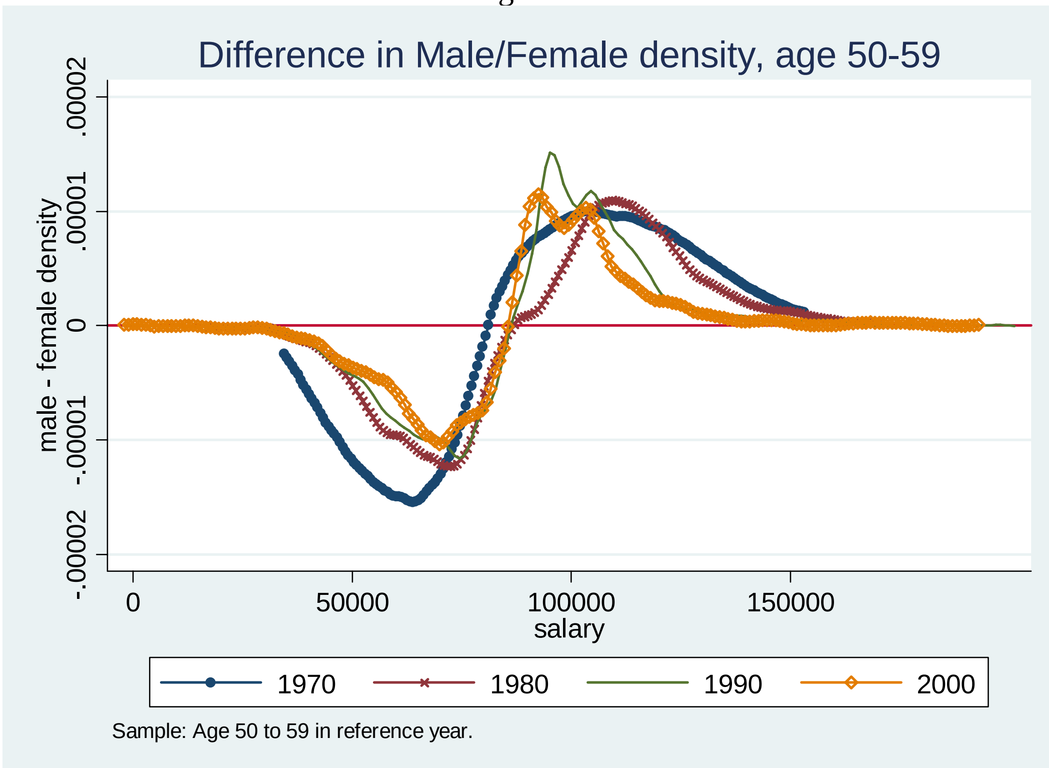


Figure 10

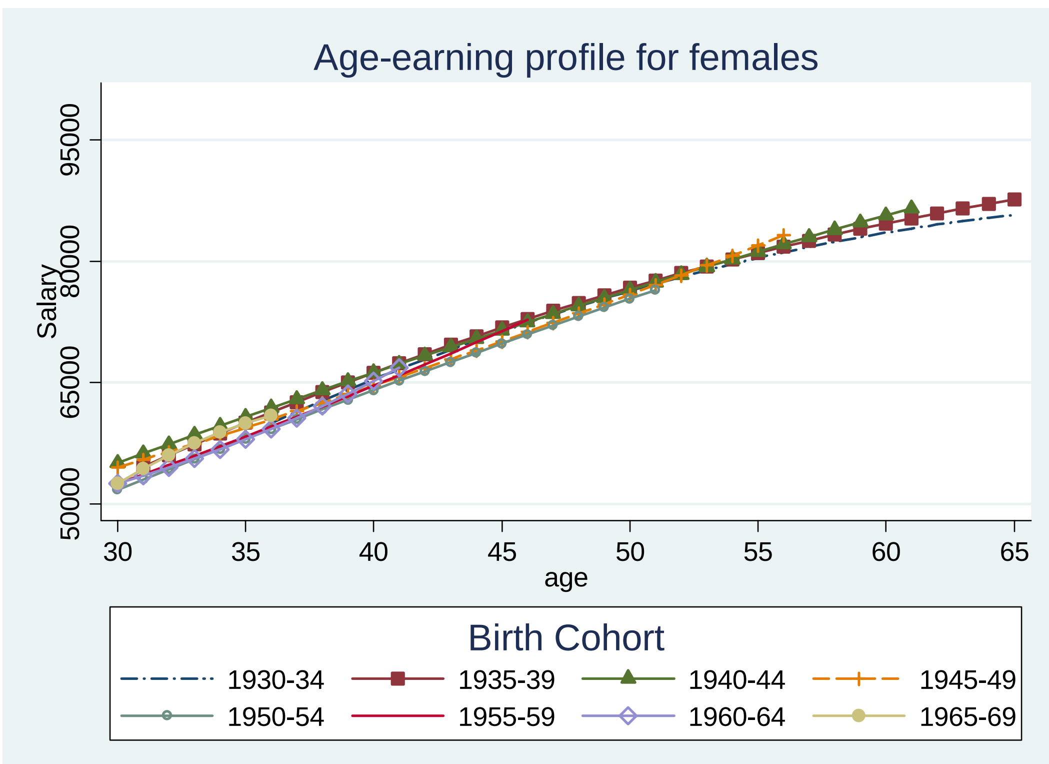


Figure 11

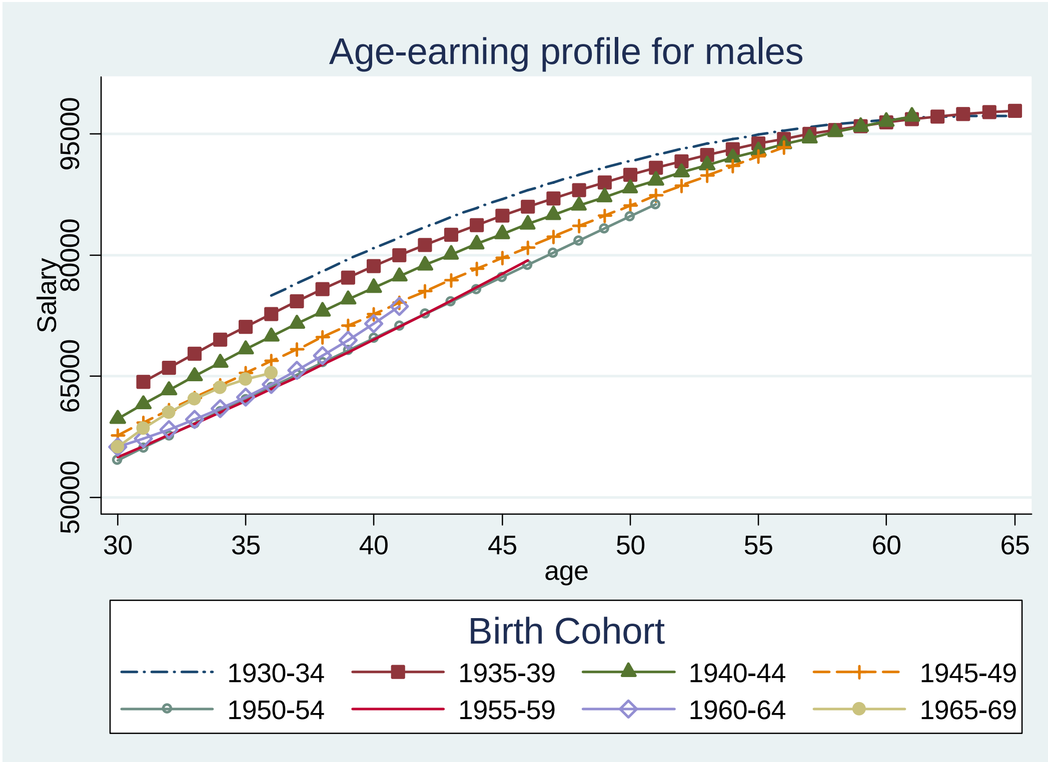


Figure 12

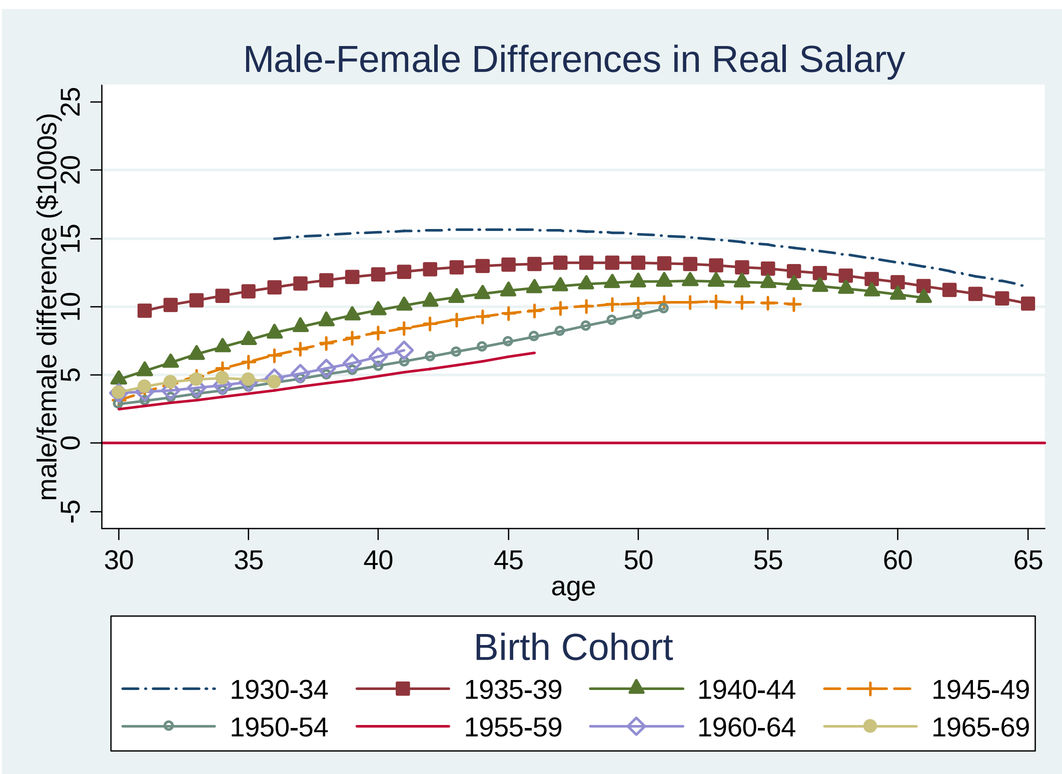


Figure 13

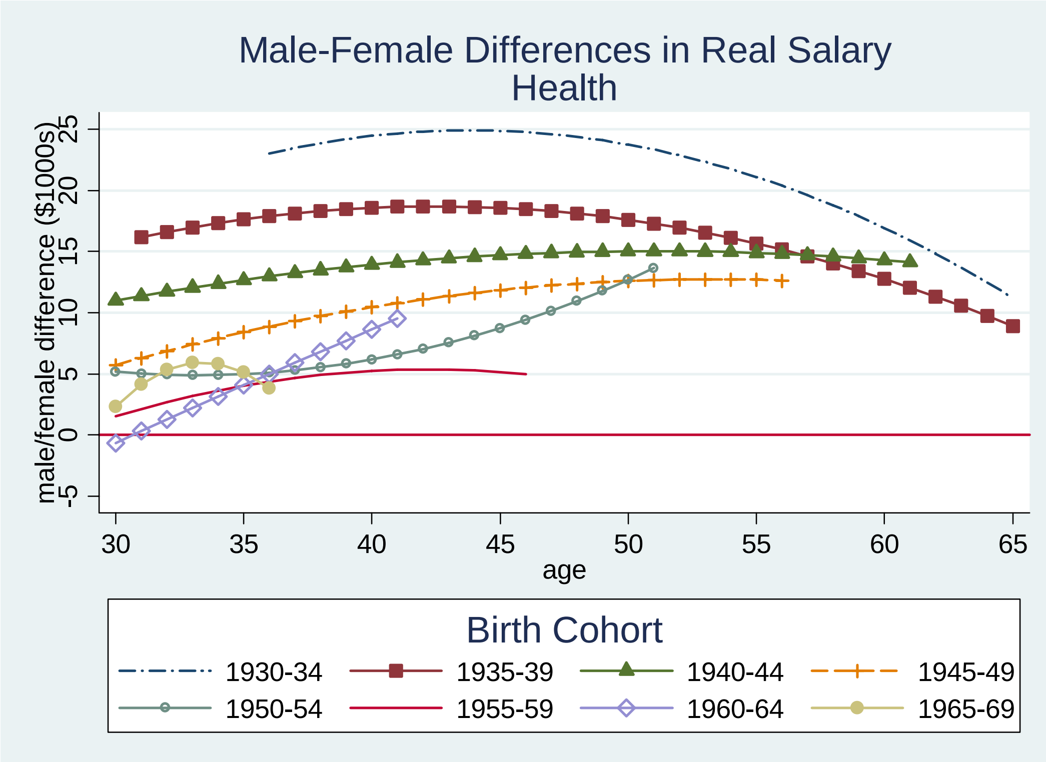


Figure 14

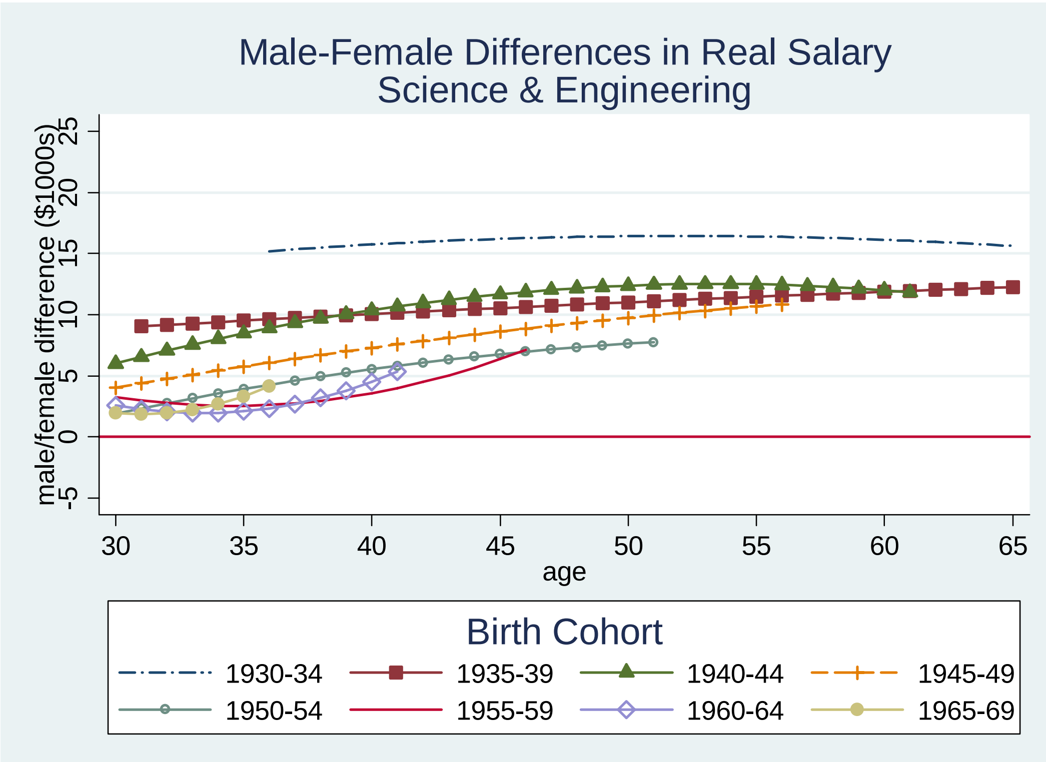


Figure 15
Real Wage, Age 30

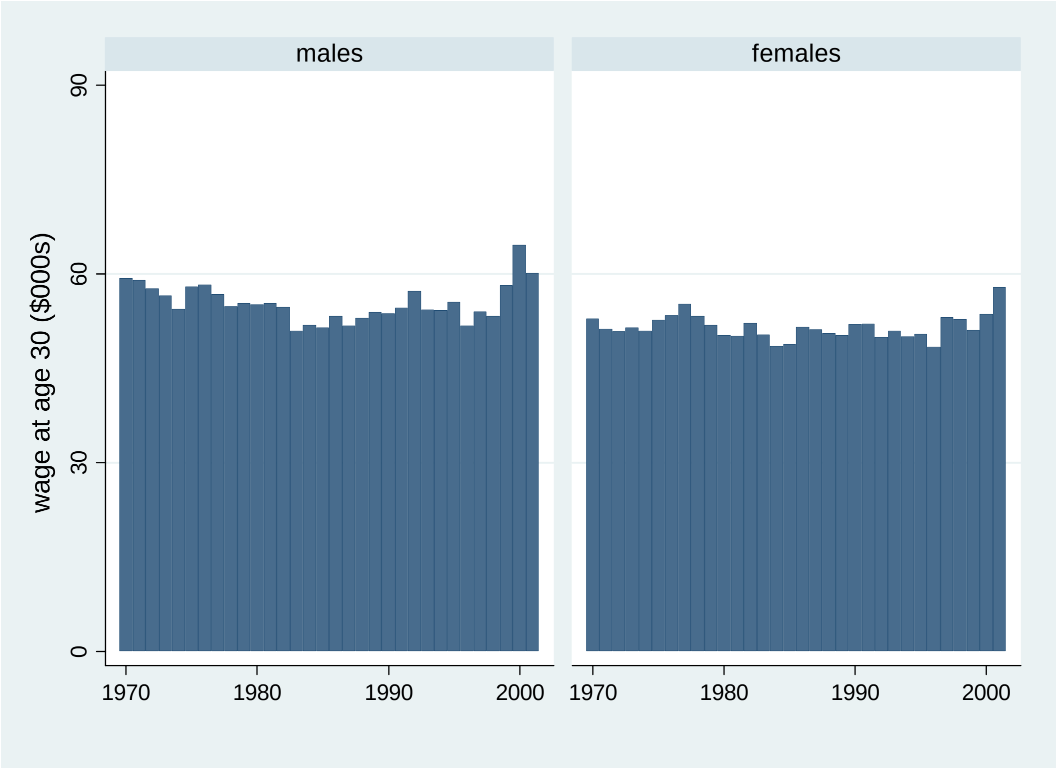


Figure 16
Real Wage, Age 40

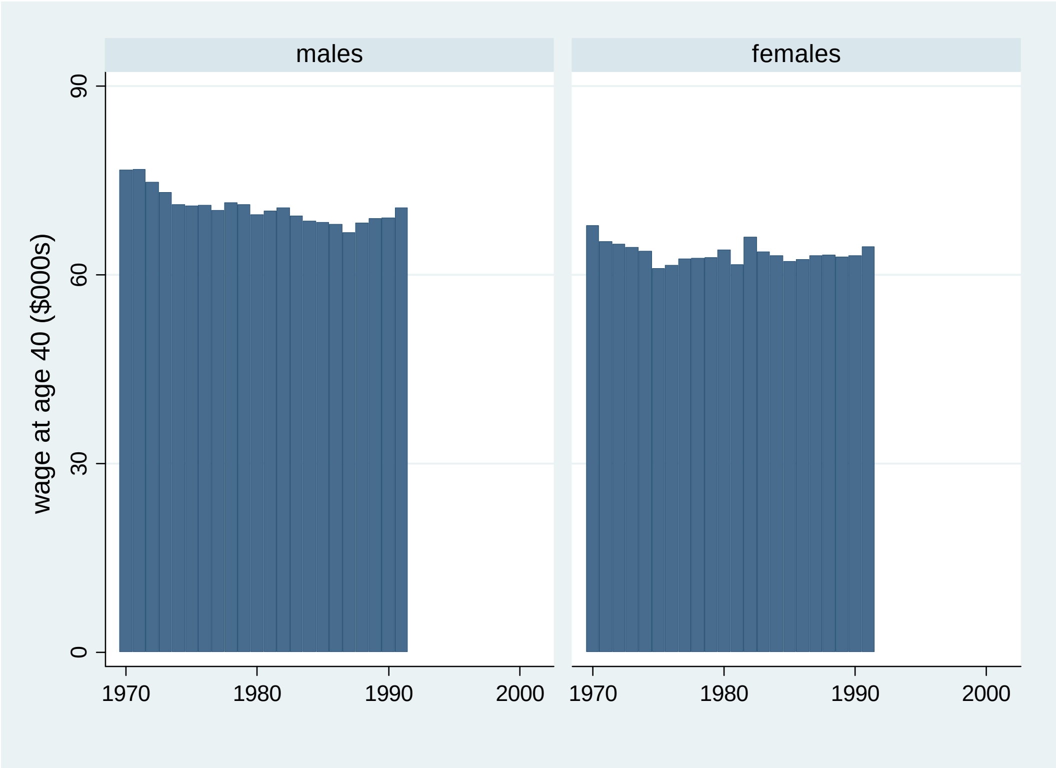


Figure 17
Real Wage, Age 50

Figure 18

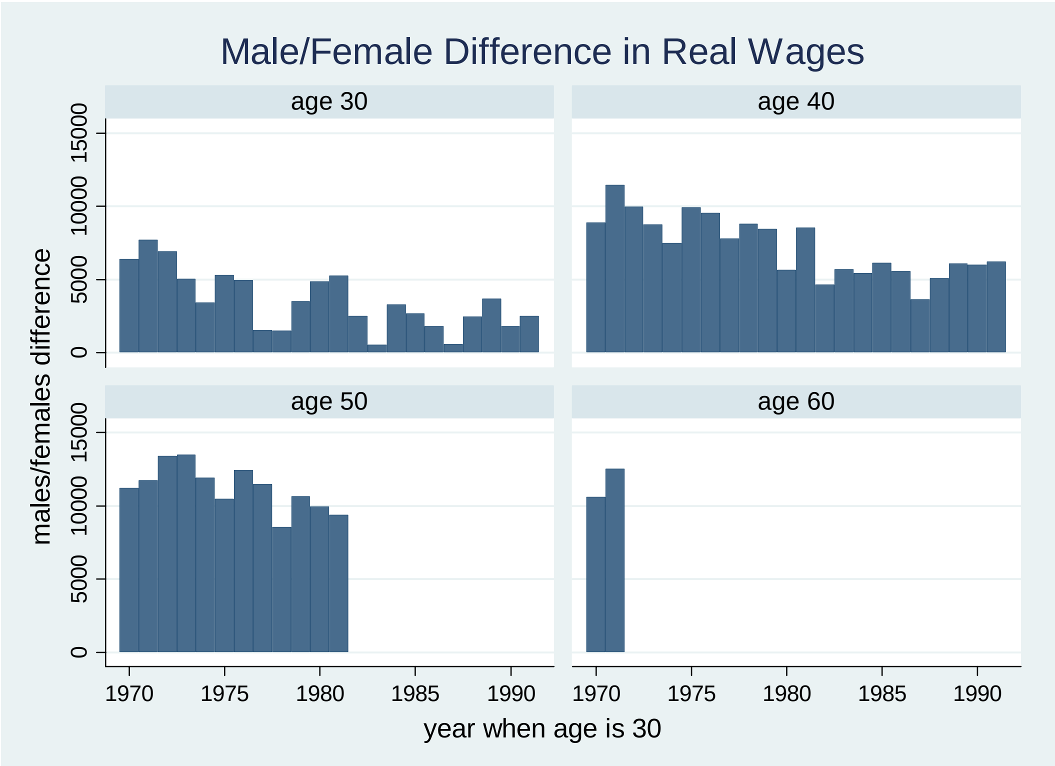


Figure 19

Figure 20

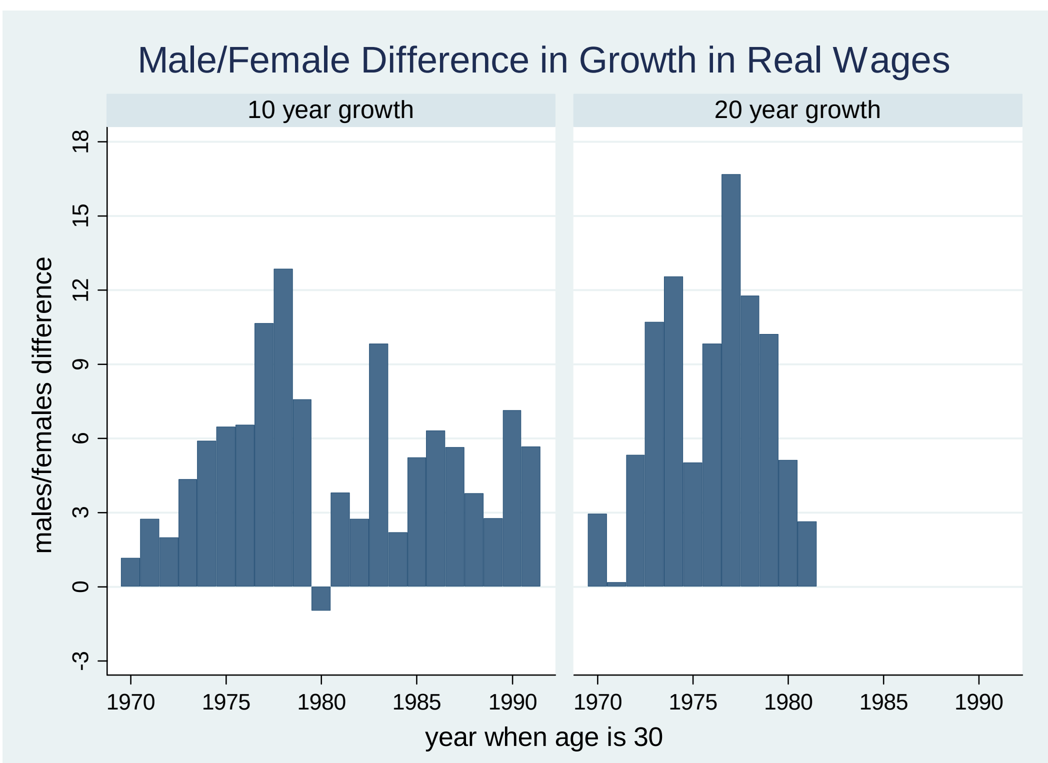


Figure 21

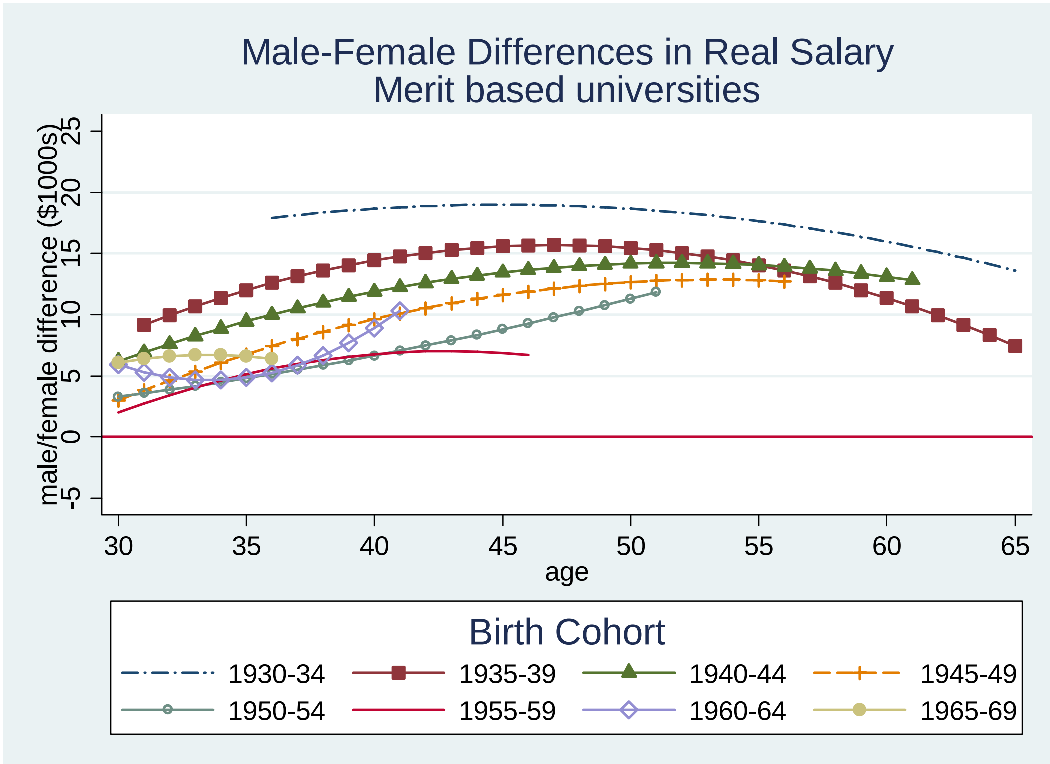


Figure 22

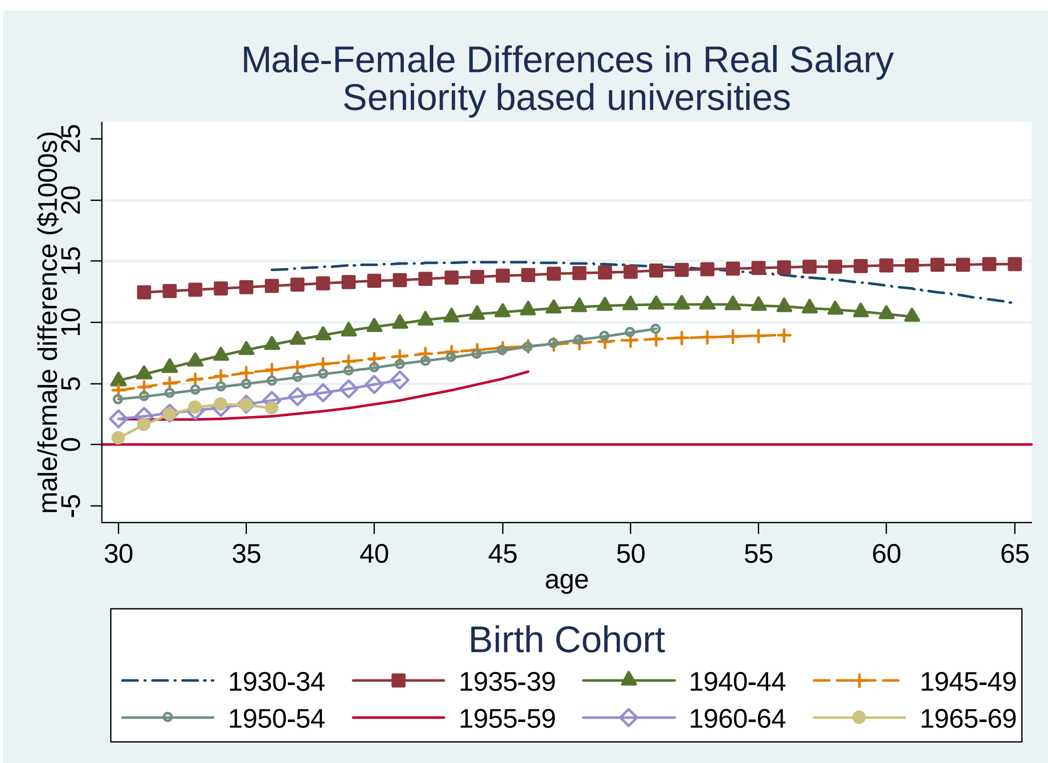


Figure 23
Age-Earnings profiles for Male Professors,
full set of control variables

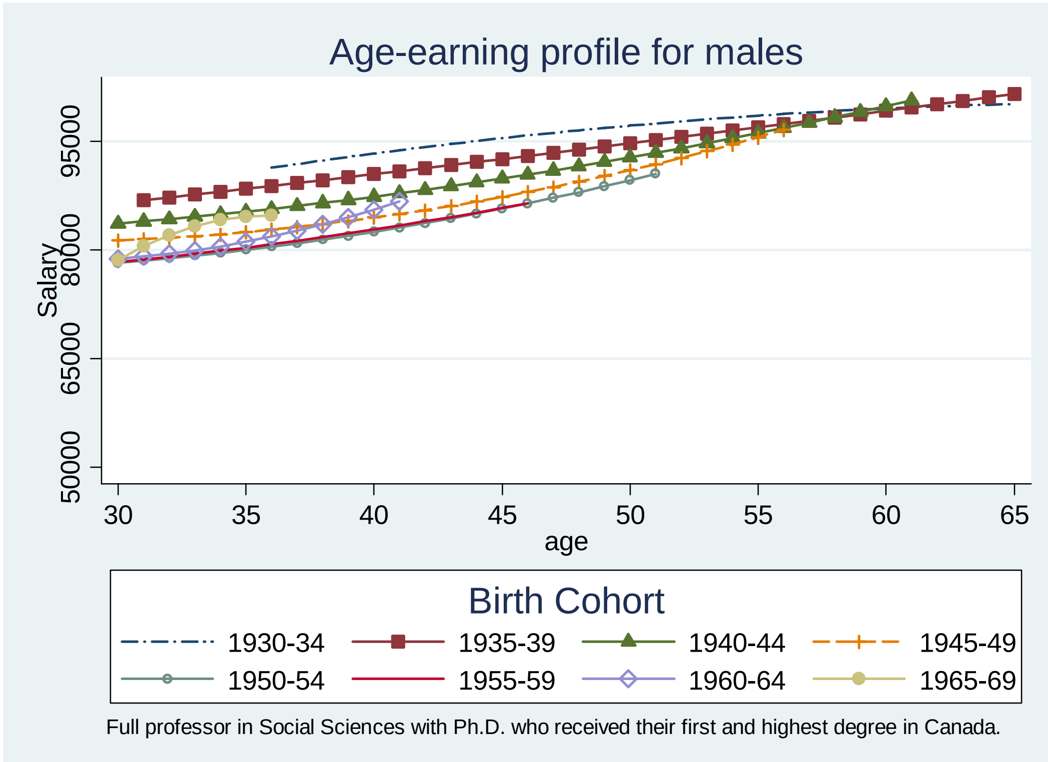


Figure 24
Age-Earnings profiles for Female Professors,
full set of control variables

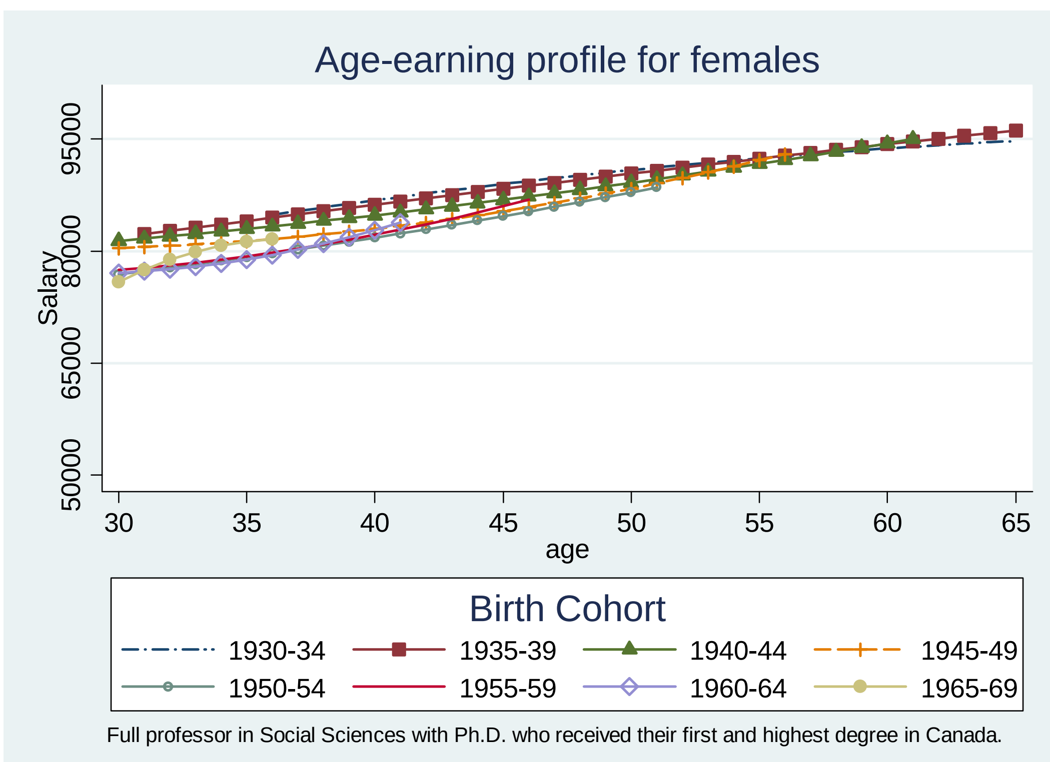


Figure 25
Male-Female Differences in Faculty Earnings,
full set of control variables

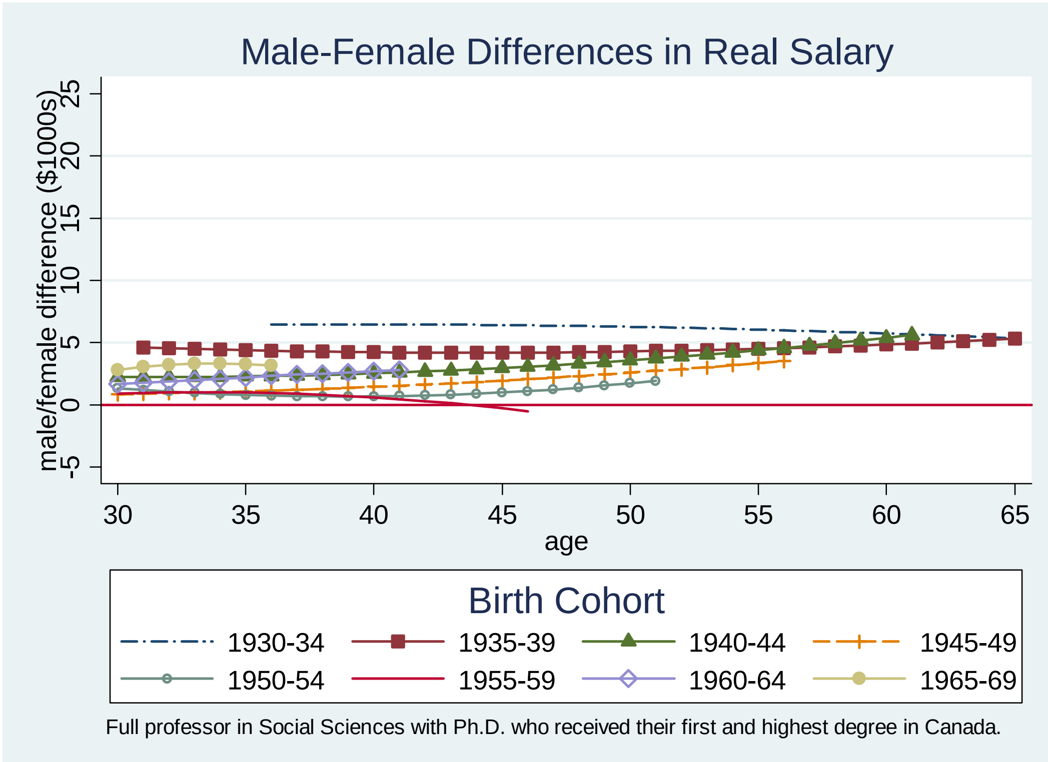


Figure 26
Male-Female Differences in Faculty Earnings,
full set of control variables and university fixed effects

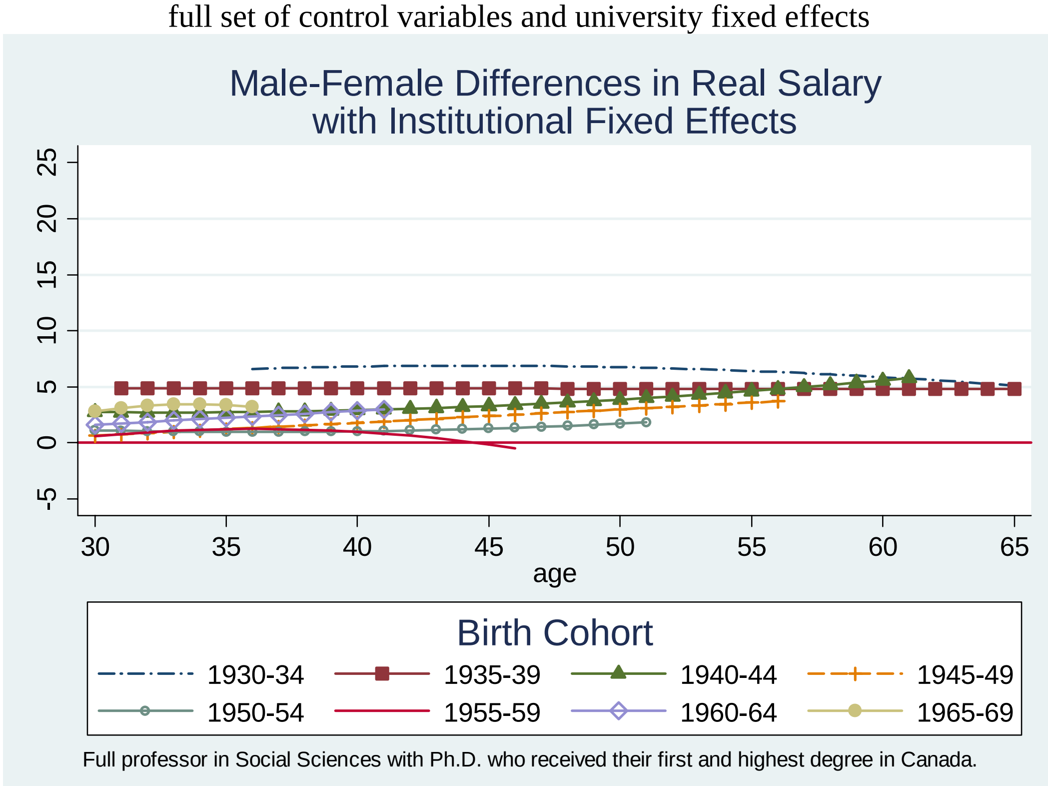


Figure 27a: Oaxaca decompositions without institutional fixed effects

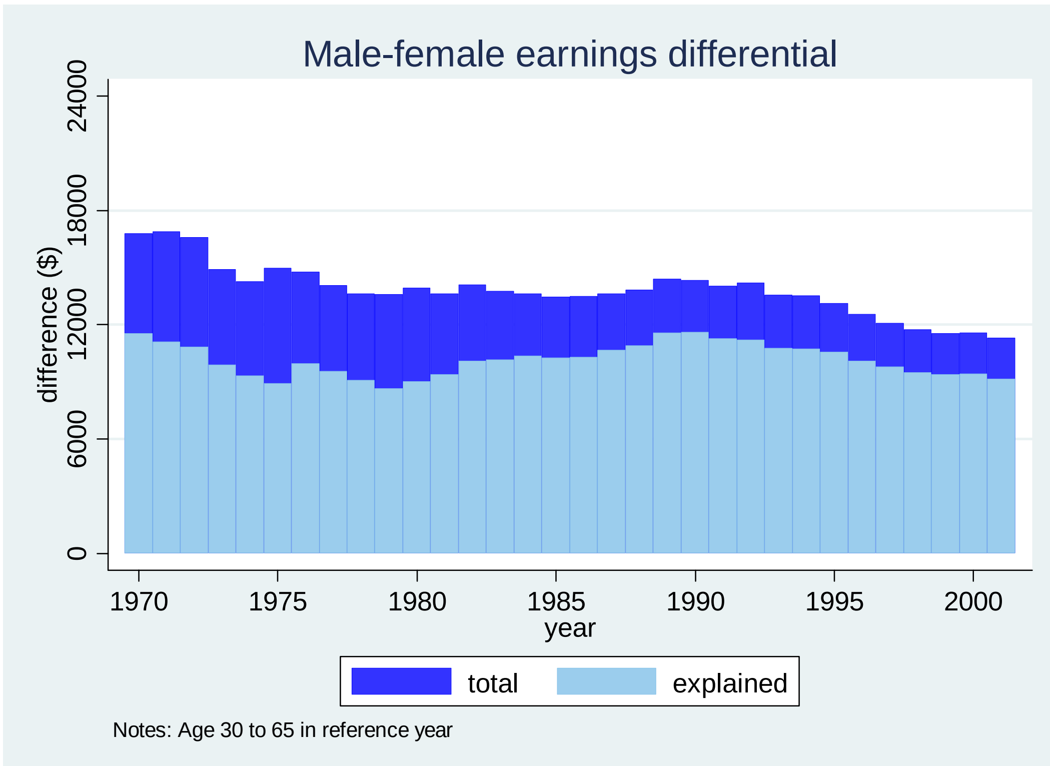


Figure 27b: Oaxaca decompositions without institutional fixed effects

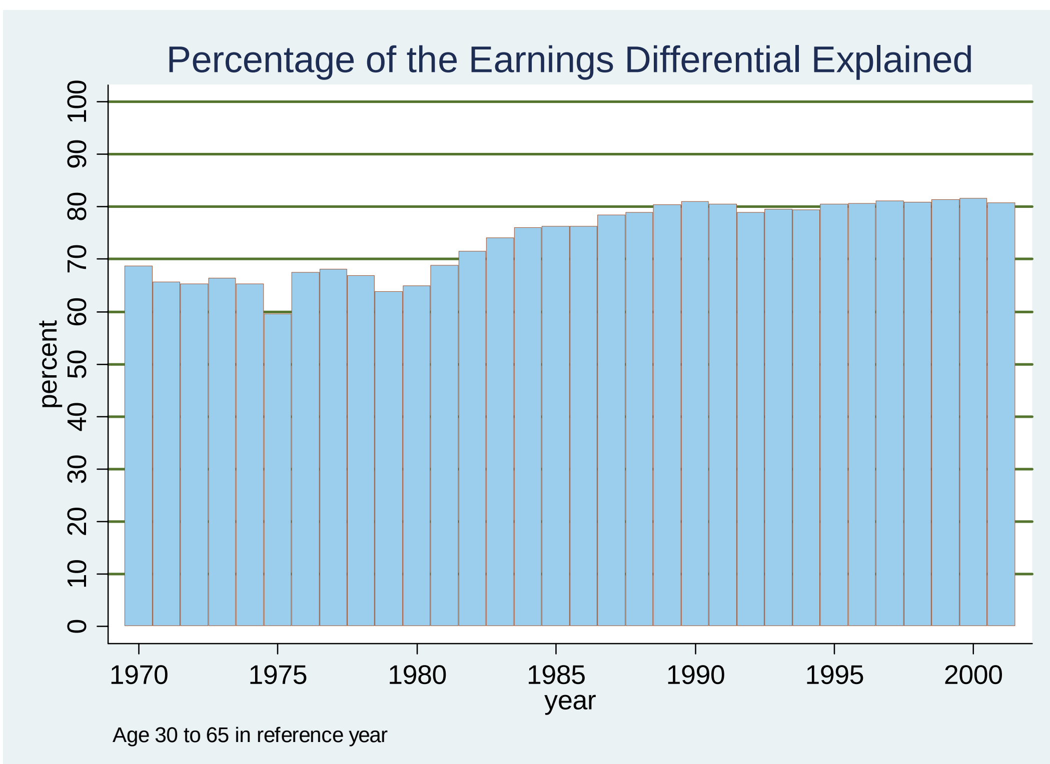


Figure 28a: Oaxaca decompositions with institutional fixed effects

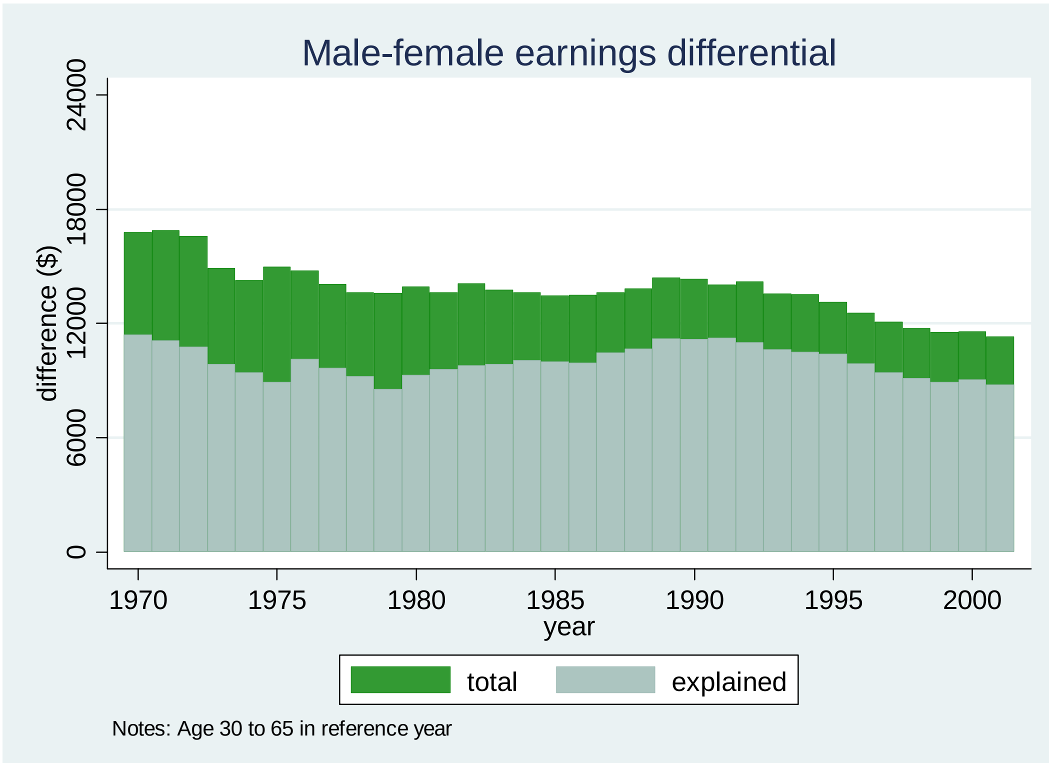


Figure 28b: Oaxaca decompositions with institutional fixed effects

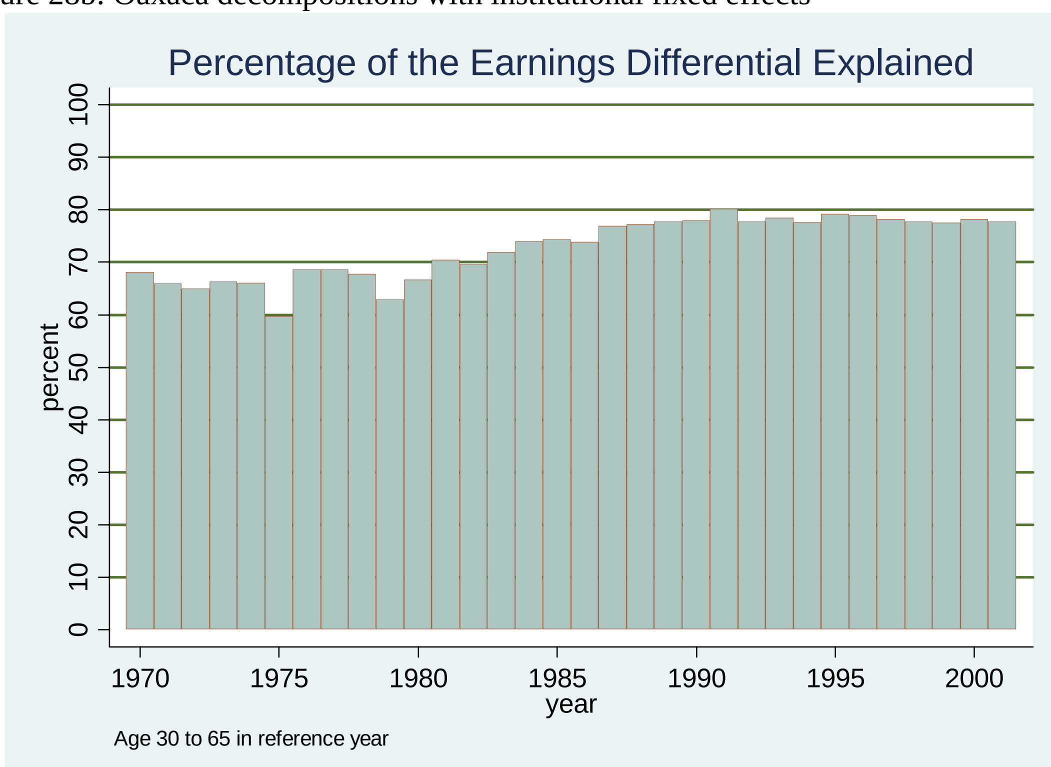


Figure 29

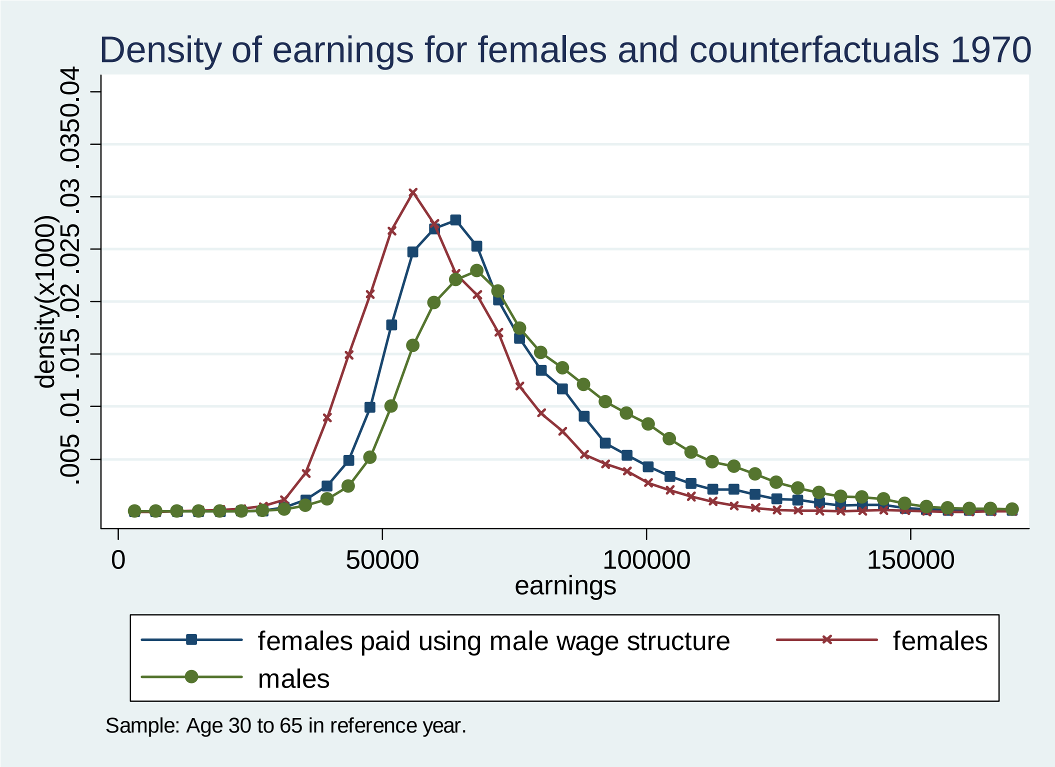


Figure 30

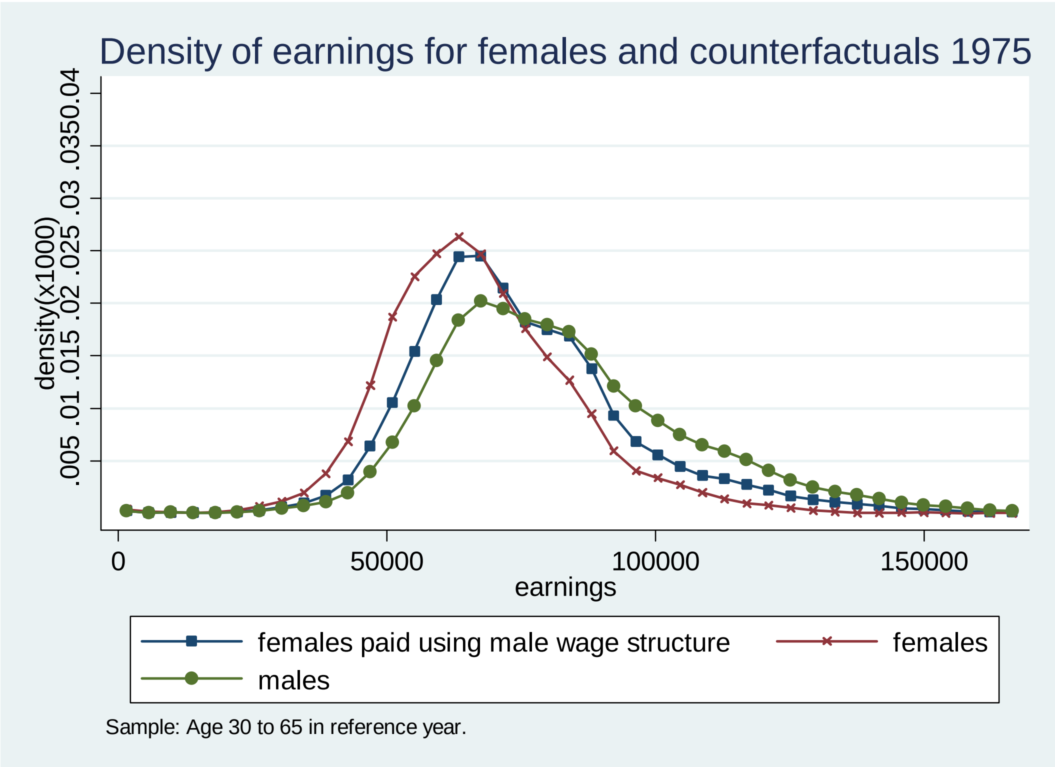


Figure 31

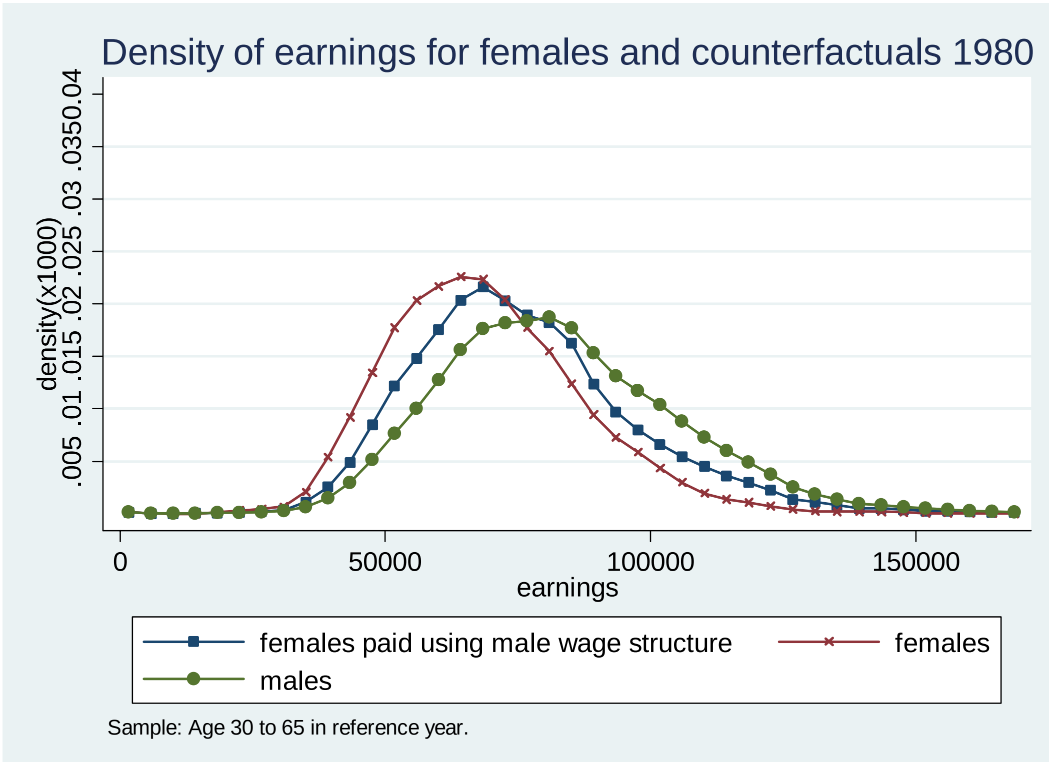


Figure 32

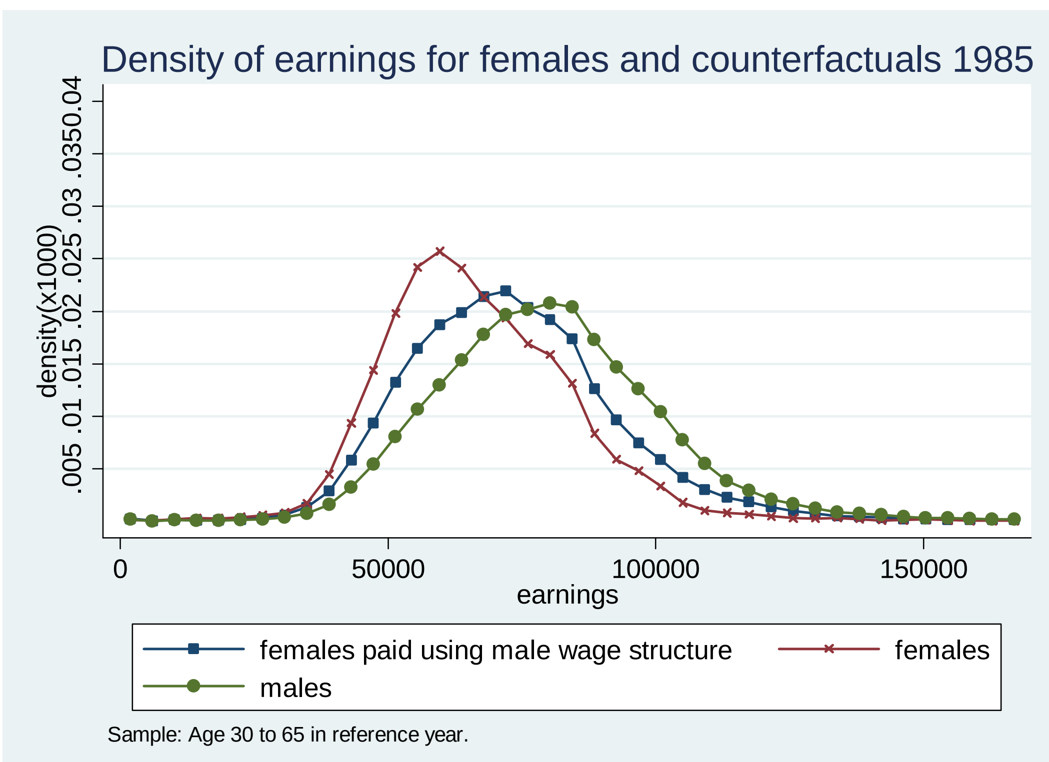


Figure 33

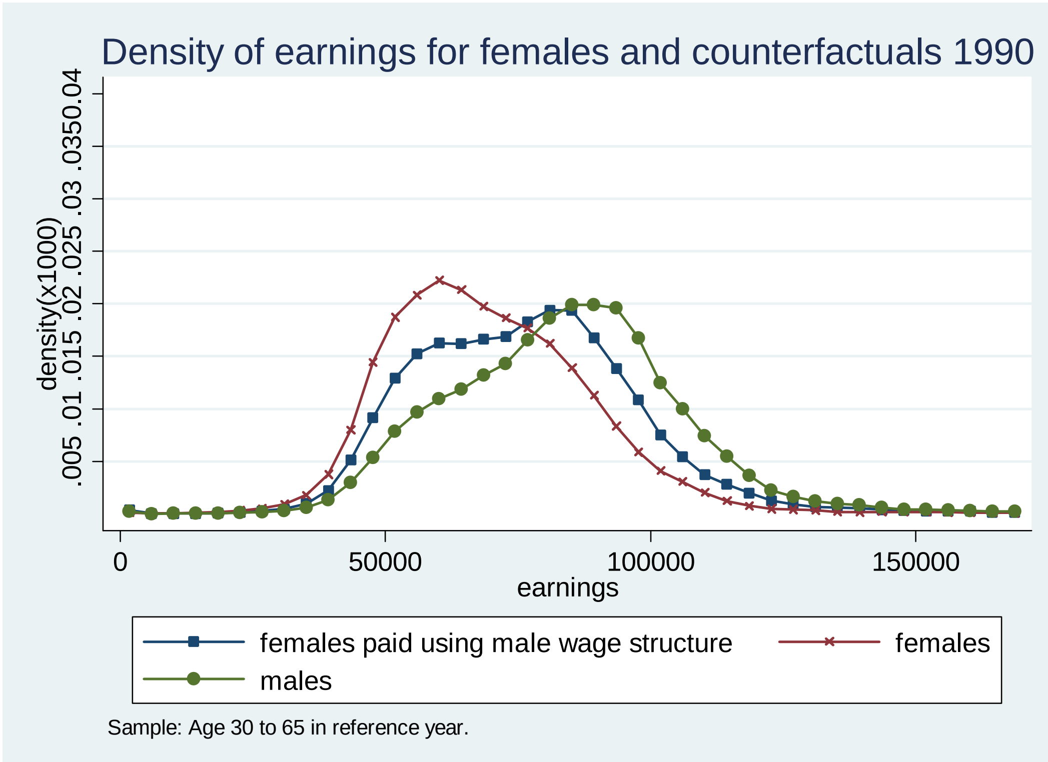


Figure 34

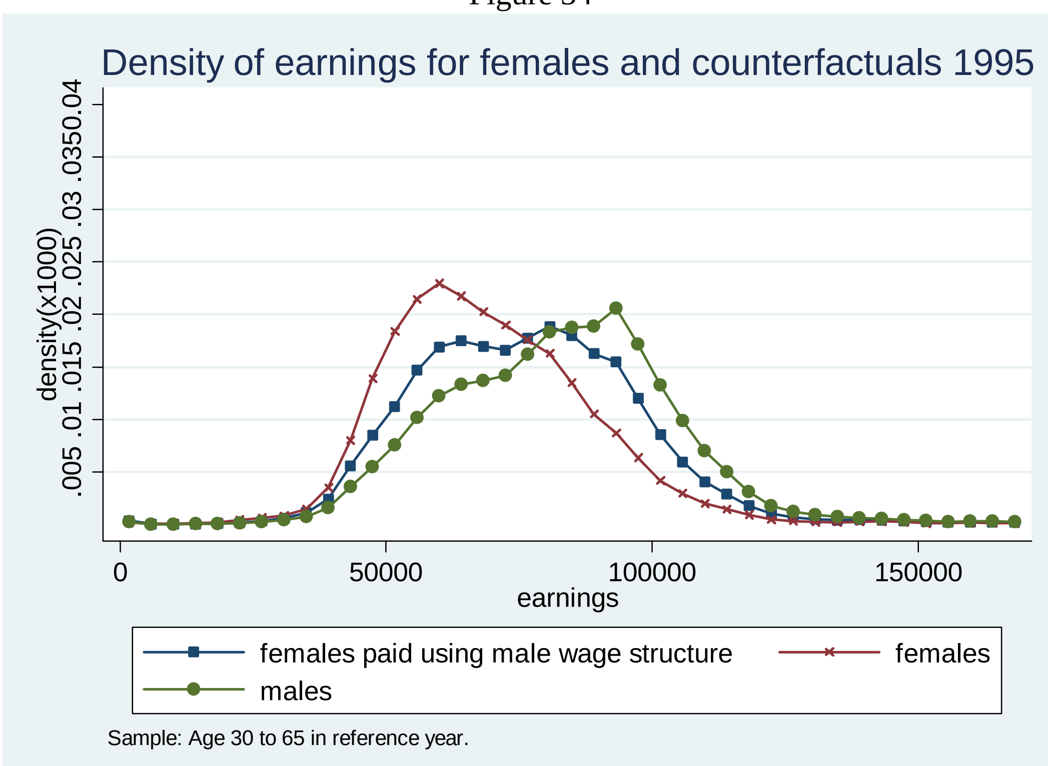


Figure 35

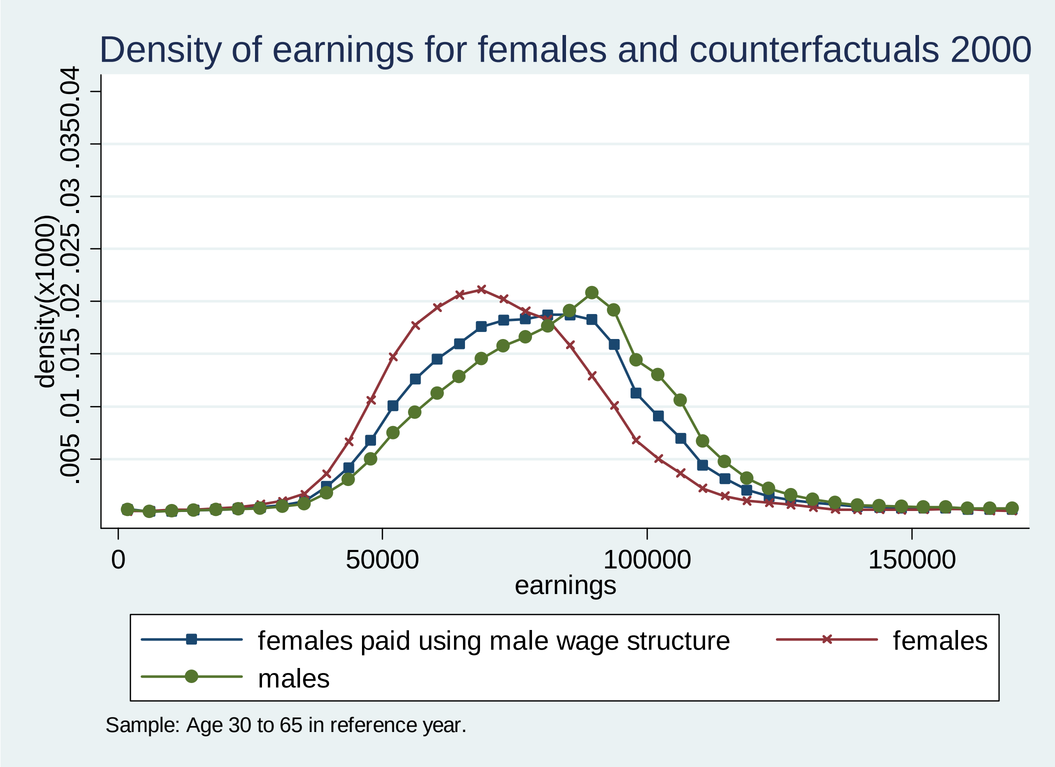


Figure 36a

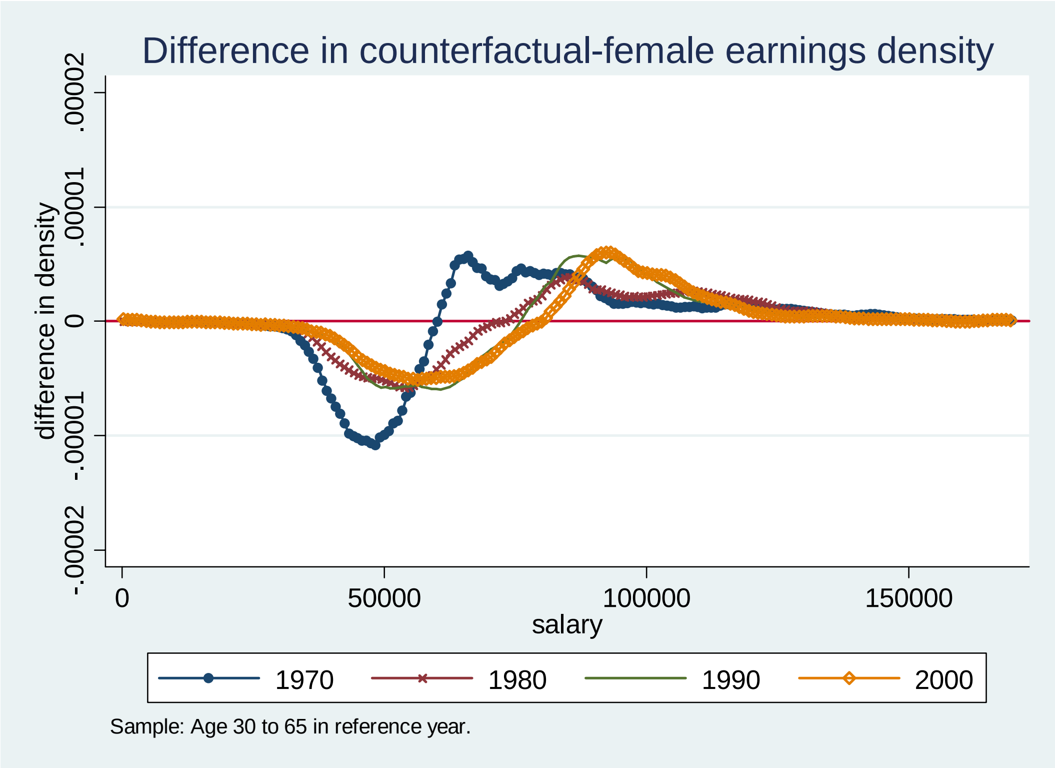
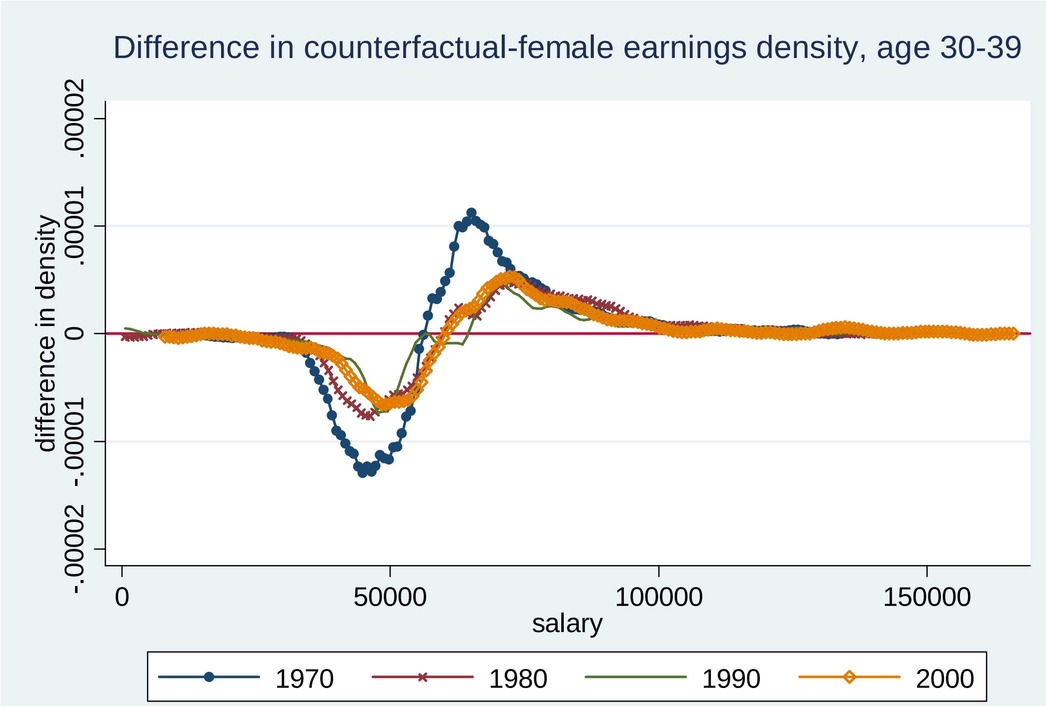
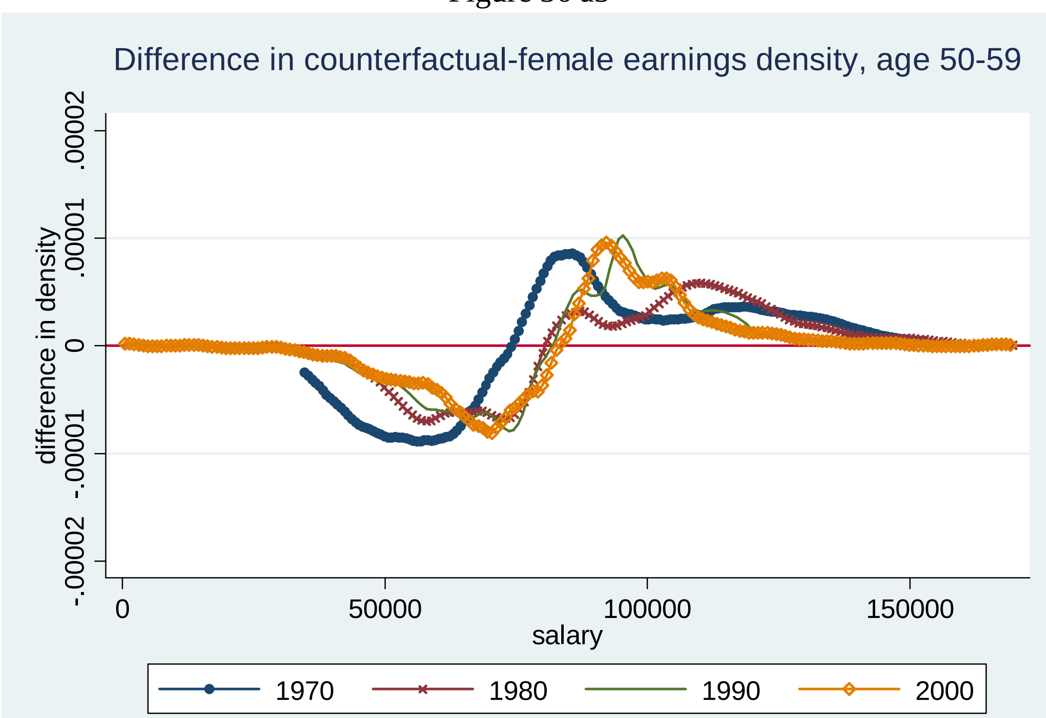


Figure 36 a2



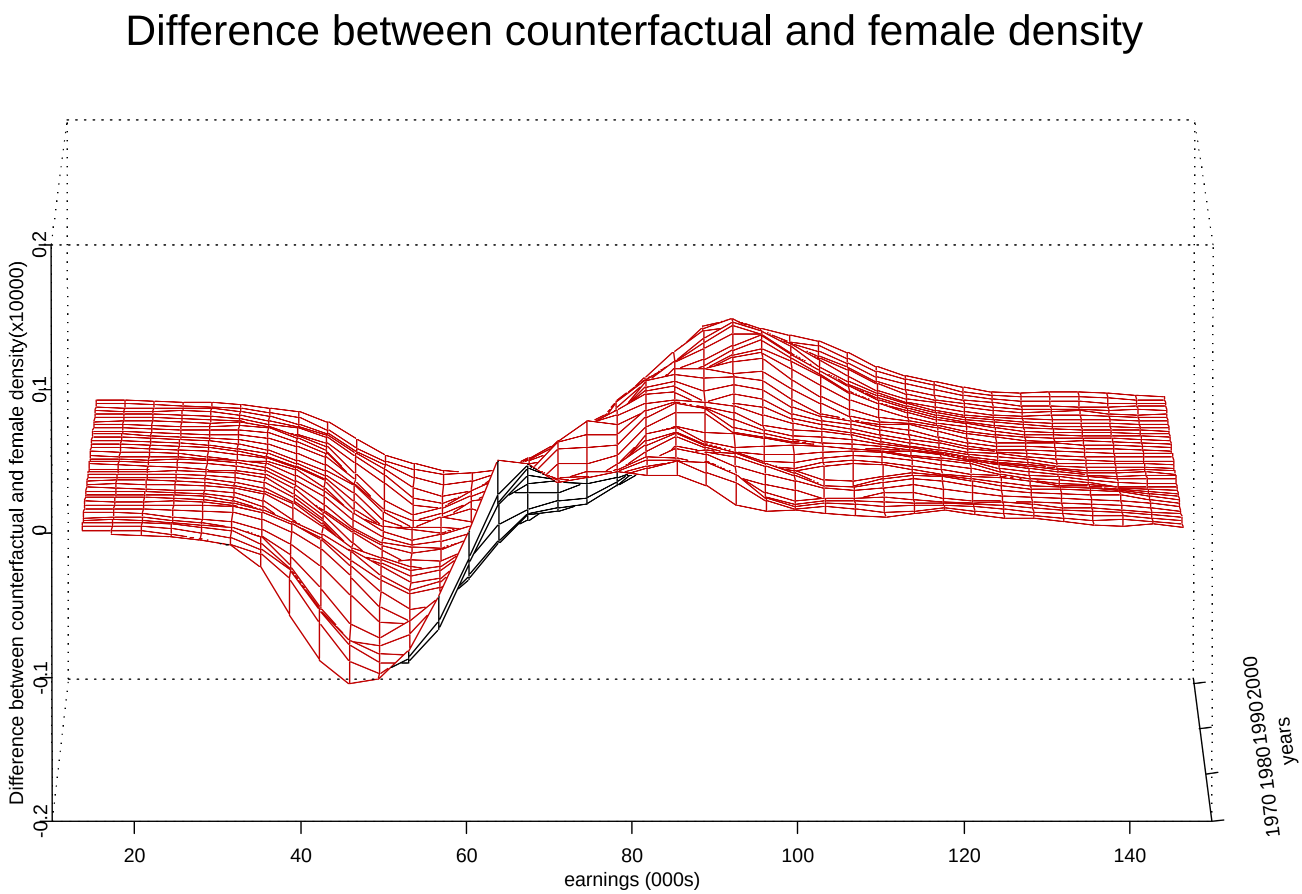
Sample: Age 30 to 39 in reference year.

Figure 36 a3



Sample: Age 50 to 59 in reference year.

Figure 36b



Difference between counterfactual and female density
Difference between counterfactual and female density(x10000)
0.2
0.1
0
-0.1
-0.2
20
40
60
80
100
120
140
earnings (000s)
1970 1980 1990 2000
years

Table 1: Percent of Male-Female Difference Independent Variables Explain (at age 36).

Cohort	With Basic Controls	With Basic Controls and Institutional Fixed Effects
1930	56.9	56.0
1935	61.9	57.3
1940	71.3	65.8
1945	82.2	79.2
1950	83.4	78.0
1955	75.5	67.8
1960	51.3	50.5
1965	29.9	27.9

Table A1: Sample Means by Year and Gender

	1970		1980		1990		2000	
	females	male	females	male	females	male	females	male
Age	42.3	40.6	43.4	44.3	44.4	47.9	47.0	49.9
Rank								
Full Professor	6.5	25.1	11.0	34.9	14.9	43.3	22.2	47.5
Associate Professor	21.2	32.8	36.4	40.9	35.3	35.3	39.0	32.6
Assistant Professor	44.7	33.3	35.8	18.9	36.1	17.1	29.7	16.5
All others	27.6	8.8	16.8	5.4	13.7	4.3	9.1	3.3
Highest Degree								
PhD	31.8	58.4	45.9	67.3	57.1	73.3	70.6	80.6
Professional	5.4	6.9	3.5	7.1	5.3	6.7	4.8	6.2
Graduate	46.2	27.5	37.0	20.1	29.0	15.0	19.5	10.3
Undergraduate	13.8	6.3	10.6	4.0	5.6	2.8	3.8	2.0
Other	2.8	0.8	3.0	1.5	3.0	2.2	1.3	0.9
Place of First Degree								
Canada	51.8	49.4	61.7	55.5	66.0	57.2	70.7	61.1
U.S.	14.3	14.5	18.3	17.2	14.6	14.5	11.3	12.5
UK	6.4	12.0	7.5	13.2	5.7	11.3	3.6	8.0
France	4.4	1.8	2.8	1.7	2.6	1.6	2.0	1.8
Other	23.2	22.3	9.7	12.4	11.1	15.3	12.3	16.5
Place of Highest Degree								
Canada	40.7	36.4	52.1	43.9	59.7	48.0	66.6	56.6
U.S.	29.4	29.2	31.9	32.3	23.6	27.9	19.1	23.7
UK	5.9	13.2	6.3	13.6	5.6	12.0	5.0	9.1
France	4.9	3.4	3.9	3.2	3.6	3.4	3.1	3.2
Other	19.2	17.7	5.9	7.1	7.5	8.7	6.2	7.4
Subject Taught								
Education	14.7	9.0	15.0	8.6	12.4	7.4	11.8	6.2
Fine Arts	4.4	3.5	5.9	3.7	5.8	3.8	5.3	3.6
Humanities	28.3	20.5	22.6	17.0	21.1	15.4	19.0	13.5
Business/Economics	2.0	6.2	2.8	8.1	5.9	9.5	6.7	10.2
Agriculture/Bio Science	8.9	7.0	7.4	7.3	6.4	7.5	6.5	8.4
Social Science	13.4	13.7	18.4	15.9	19.1	15.7	20.7	15.9
Engineering/Applied Sci.	0.5	10.0	0.5	8.7	1.3	9.3	2.5	10.4
Nursing*	11.1	---	11.4	---	8.2	---	6.8	---
Health	10.7	12.6	11.7	14.6	14.0	15.3	13.7	15.1
Math/Physics/Science	4.4	15.4	3.4	14.9	4.6	15.3	5.7	15.8
Other Subject	1.7	2.0	0.8	1.3	1.1	0.7	1.3	0.9

Source: Full-Time University Teaching Staff Data 1970-2001.
Notes: Sample restricted to people age 30 to 65.
*For males, “Nursing” is shown as part of “Other Subject” due to small sample size.