Public and Private Sector Earnings in Alaska

Prepared for
Alaska Department of Administration

By
Andrew J. Bibler • Mouhcine Guettabi
ajbibler@alaska.edu • mguettabi@alaska.edu

Institute of Social and Economic Research
University of Alaska Anchorage
3211 Providence Drive
Anchorage, Alaska 99508

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1 Summary

We compare earnings in the Alaska public and private sector labor markets from 2001 -2016. Public sector laborers are older and more likely to be female, suggesting that taking these differences into consideration will be important in our comparisons. We also focus on the public-private sector earnings gaps for men and women separately, as the magnitude and even direction of the gap depends on this distinction. We go about this in three ways: unconditional comparisons, conditional earnings gaps, and comparing the earnings and growth of individuals who remain with the same employer. Below are the main findings:

- The unconditional average public-private earnings gaps for men and women are of opposing signs (see Table 1).
  - Men in the public sector earn about $2,129 *less* in quarterly wages than men in the private sector, on average.
  - Women in the public sector earn about $498 *more* in quarterly wages than women in the private sector, on average.
- On average, across all occupations, men and women have higher initial earnings in the private sector at the beginning of a job spell.
  - For men, the difference is $3113 in quarterly earnings.
  - For women, the difference is $760 in quarterly earnings.
- Among workers who remain with the same employer, earnings growth is 1% and 2% higher in the public sector for men and women, respectively.
- For men, despite the faster growth, they don't catch up to the earnings of private sector employees within 10 years of tenure in most occupations (See Tables 9 and 11, and Figure 12).

- Women in the public sector earn more than their private sector counterparts within a few years of tenure, on average.
- There is substantial heterogeneity in the earnings gap across occupations (See Tables 10 and 12, and Figure 13).

2 Characteristics of the Public and Private Sectors in Alaska

Table 1 shows some descriptive information on the public and private sector workforces.

Table 1: Summary Statistics (Q1)

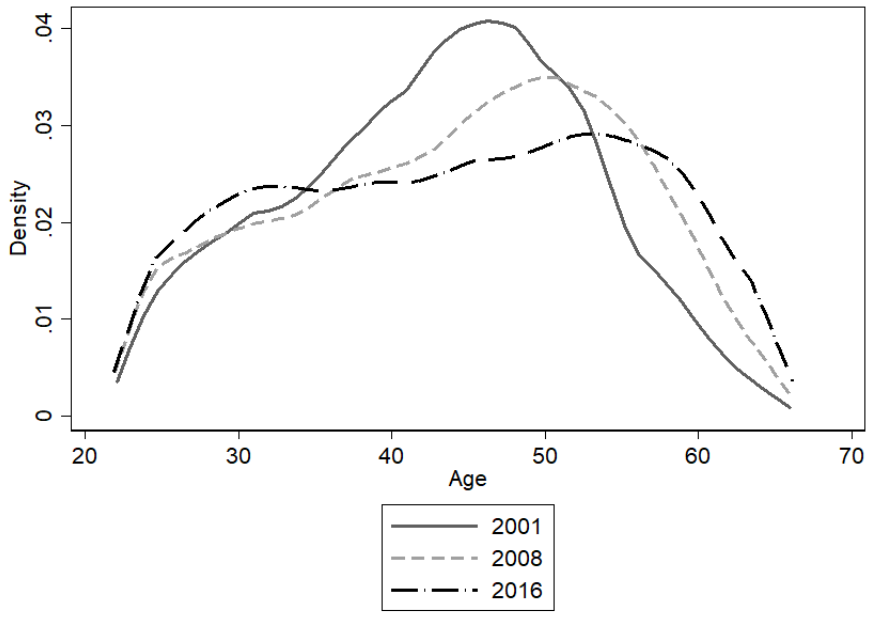
	Full Sample		**Men**		**Women**	
	Public	**Private**	**Public**	**Private**	**Public**	**Private**
Quarterly Earnings	10,600.47	11,852.79	12,076.88	14,206.18	9,487.58	8,989.13
	(6,867.51)	(16,706.52)	(7,783.41)	(20,288.38)	(5,845.19)	(10,145.23)
Quarterly Earnings (2016 $)	12,208.26	13,546.70	13,921.57	16,239.14	10,916.80	10,270.48
	(7,711.29)	(18,826.77)	(8,719.22)	(22,962.13)	(6,565.08)	(11,162.94)
Ln Earnings	8.92	8.90	9.05	9.07	8.82	8.69
	(1.11)	(1.13)	(1.14)	(1.15)	(1.07)	(1.08)
Ln Earnings (2016 $)	9.07	9.04	9.19	9.22	8.97	8.84
	(1.10)	(1.12)	(1.13)	(1.14)	(1.07)	(1.07)
Male	0.43	0.55	1.00	1.00	0.00	0.00
	(0.50)	(0.50)	(0.00)	(0.00)	(0.00)	(0.00)
Age	44.03	40.93	44.08	41.08	44.00	40.75
	(10.71)	(11.32)	(10.74)	(11.28)	(10.68)	(11.37)
Individuals	158,774	472,219	68,426	250,087	90,348	222,132
Observations	942,319	2,818,719	405,012	1,547,207	537,307	1,271,512

Notes: This table displays average values and standard deviations for first quarter observations from 2001 - 2016 by sector.

Public sector workers are older (44 vs 40), more likely to be female (57% vs 45%), and their first quarter earnings are $1,338 less than first quarter earnings of private sector workers, on average. This amounts to a yearly difference of more than $5,000. In the rest of this document, we explore the differences between the two sectors more fully, including differences in earnings and growth at the occupational level. Figures 1 and 2 show the age distributions over time of public and private sector workers, respectively. The proportions of both the

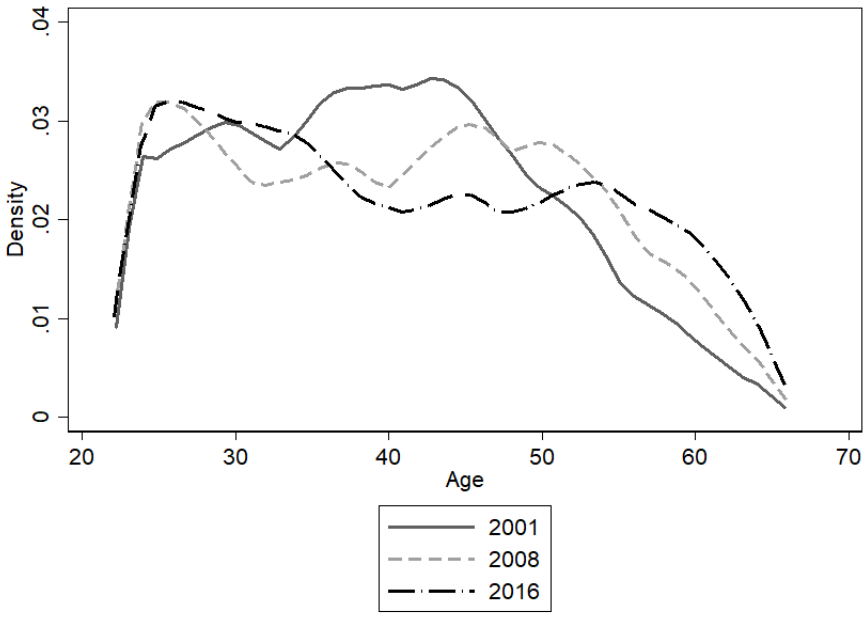
youngest (20 to 30) and oldest (55 to 65) workers in our sample have increased since 2001. The increase is especially noticeable for the 55 to 65 age group, consistent with the fact that the median age of Alaska residents has increased over the sample period. From Figure 2, the private sector also has a relatively young workforce. In fact, the highest density of private sector workers was in the 23-30 age range in 2016, and the density steadily decreases with age. On the other hand, the density of the age distribution in the public sector is steadily increasing with age up to about 50. It is important to take the differences in the age distribution into consideration when comparing the earnings of employees in the public and private sectors. For example, the differences in the age distribution could be reflective of differences in education levels or work experience. Figure 3 shows the size of the Alaska labor market and the share of workers in the public sector. Alaska employment has grown steadily for most of the period with the exception of a recent decline due to the recession. The share of workers in the public sector has also remained steady over the sample period.

Figure 1: Public Sector Age Distribution Over Time (Q1)



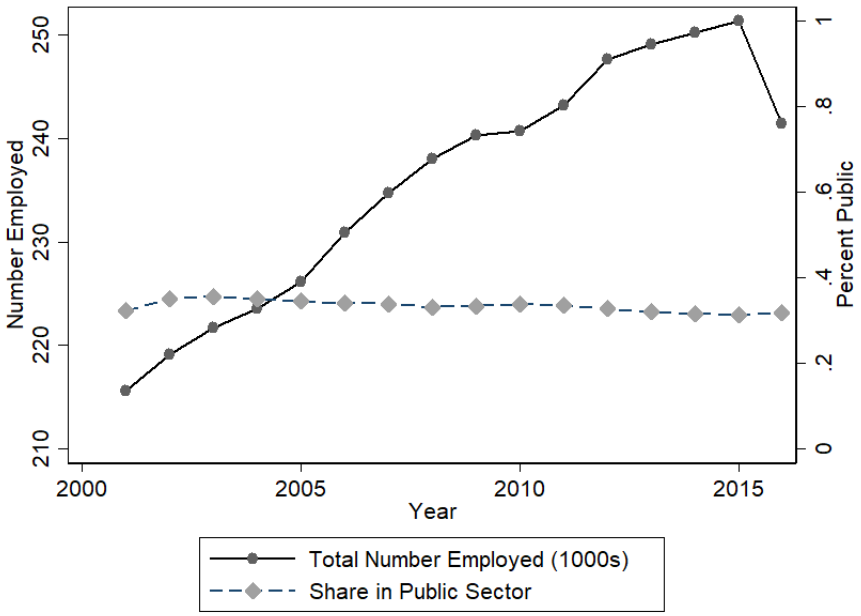
Notes: Age distribution of public sector employees during the first quarter of 2001, 2008, and 2016.

Figure 2: Private Sector Age Distribution Over Time (Q1)



Notes: Age distribution of private sector employees during the first quarter of 2001, 2008, and 2016.

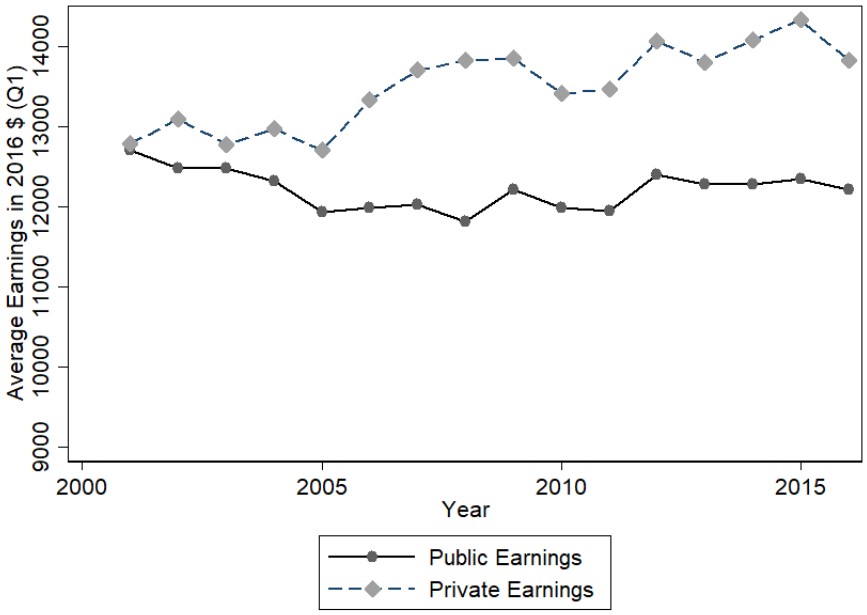
Figure 3: Size of AK Labor Market



Notes: This figure shows the size of the labor market in Alaska from 2001 - 2016, and the share of the total market working in the public sector. Both lines are based on the first quarter numbers.

3 Unconditional Earnings Gaps

Figure 4: Trends in Public and Private Earnings (2016 $)

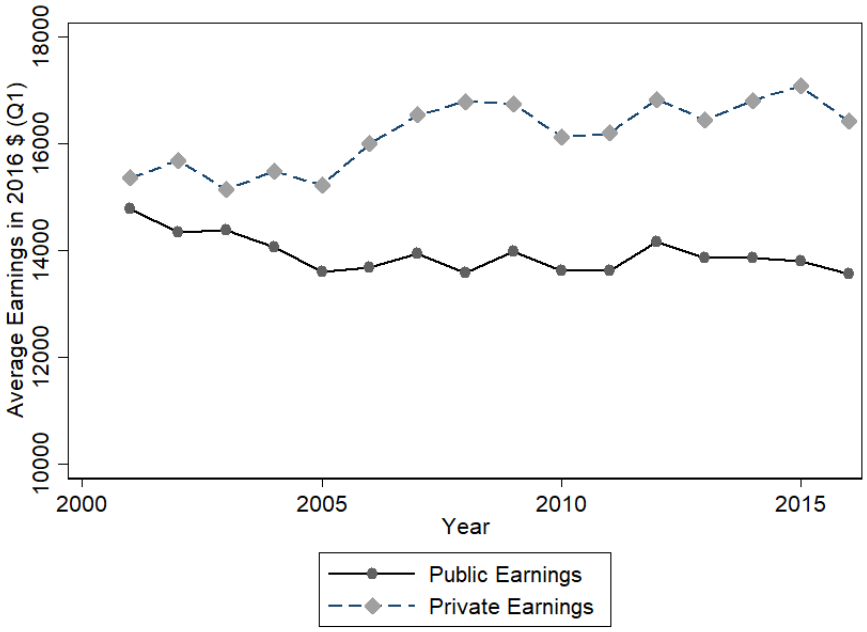


Notes: This figure displays average real earnings for first quarter public and private sector employees. Earnings are in 2016 dollars, and were calculated using the Anchorage CPI - U.

Figure 4 shows the average earnings in the public and private sectors from 2001 to 2016. The gap between sectors emerged in 2002 and has grown over the sample period. It seems that the divergence stems from faster private sector growth during times of favorable economic conditions. This may be especially relevant given that the Alaska economy is dependent on a volatile resource. In the public sector, growth is relatively stable, showing a slight decline in real earnings since 2001. Combining males and females masks important differences.[1] In Figures 5 and 6, it is clear that the private sector premium comes from differences in earnings between private and public sector males. In fact, women working in the public sector earn more on average that their private sector counterparts throughout the sample.

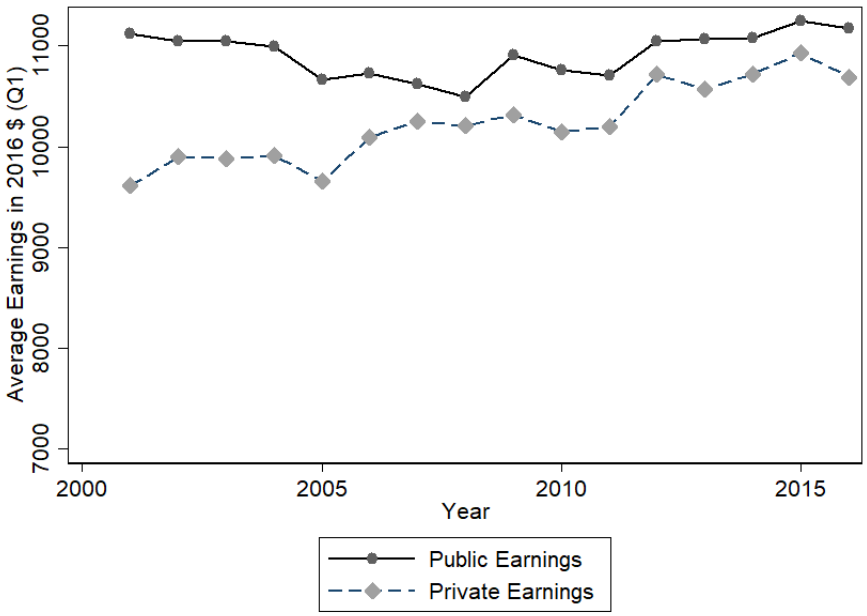
[1] http://www.iser.uaa.alaska.edu/Publications/2016_07-OverpaidOrUnderpaidReport.pdf.

Figure 5: Trends in Public and Private Earnings (Men, 2016 $)



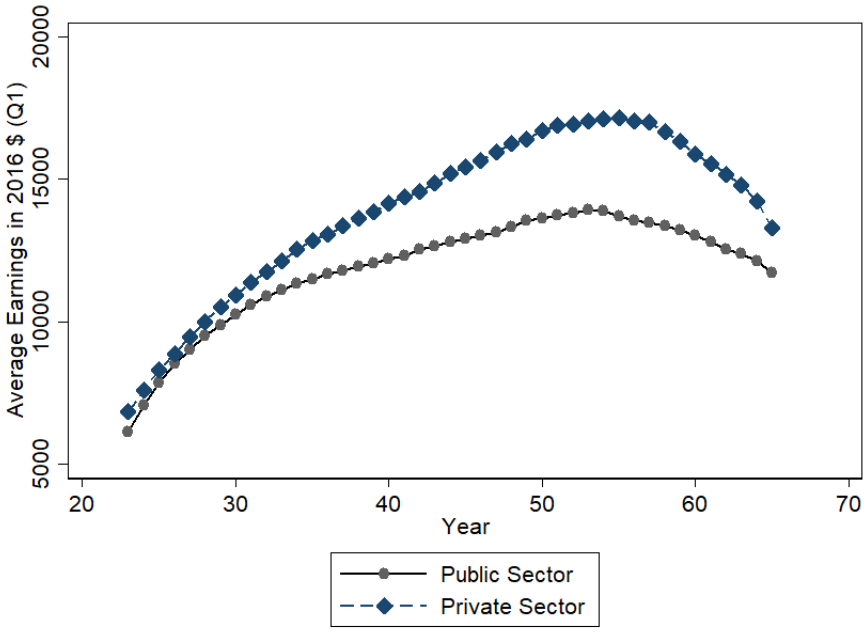
Notes: This figure displays average real earnings for first quarter public and private sector male employees. Earnings are in 2016 dollars, and were calculated using the Anchorage CPI - U.

Figure 6: Trends in Public and Private Earnings (Women, 2016 $)



Notes: This figure displays average real earnings for all first quarter public and private sector female employees. Earnings are in 2016 dollars, and were calculated using the Anchorage CPI - U.

Figure 7: Real Earnings by Age - Men and Women (2001-2016:Q1)



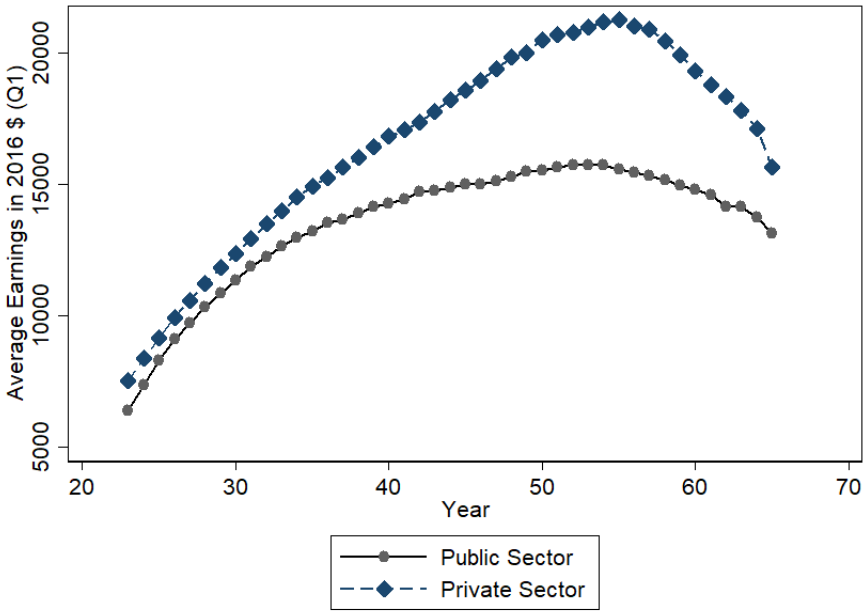
Notes: This figure displays average real earnings by age for first quarter public and private sector employees. Earnings are in 2016 dollars, and were calculated using the Anchorage CPI - U.

Figure 7 displays unconditional differences in earnings by age. To be clear, Figure 7 compares earnings at each age of the distribution regardless of job tenure length, occupation, or year. For example, 40 year olds in the public sector, on average, earn $1,959 less than 40 year olds in the private sector. Privates sector workers earned more than their public sector counterparts at every age, with the biggest difference between 57 year olds. Interestingly, the differences are essentially non-existent for 20 to 30 year olds.[2] Once again, the differences are split by gender in Figures 8 and 9. Most of the public sector premium for women comes from women over age 50. For men, earnings diverge significantly after age 35.

In the next section, we turn our attention to individual conditional comparisons by adjusting for age, gender, occupation, and industry. This allows us to compare individuals who are similar with the exception of the market in which they work (Public vs Private).

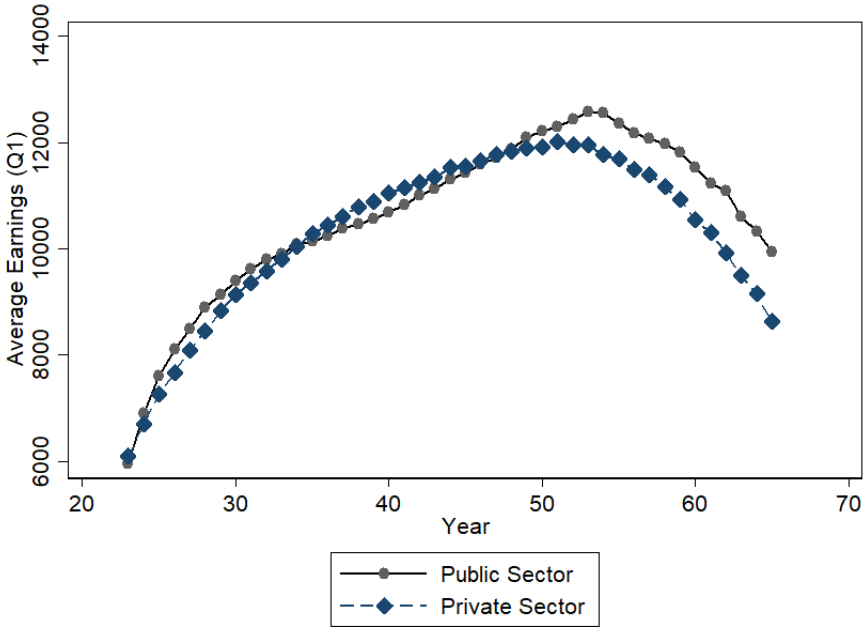
[2]Once we control for occupation, gaps in this age range emerge, because of differences in the occupational composition of the sectors. For example, there may be low wage retail jobs in the private sector with no equivalent positions in the public sector.

Figure 8: Real Earnings by Age - Men (2001-2016:Q1)



Notes: This figure displays average real earnings by age for all first quarter public and private sector male employees. Earnings are in 2016 dollars, and were calculated using the Anchorage CPI - U.

Figure 9: Real Earnings by Age - Women (2001-2016:Q1)



Notes: This figure displays average real earnings by age for all first quarter public and private sector female employees. Earnings are in 2016 dollars, and were calculated using the Anchorage CPI - U.

4 Conditional Differences in Earnings

4.1 Earnings Gap from 2001 - 2016

We estimate the public-private sector earnings gaps after accounting for a number of factors. The factors that we are able to account for are the age of the employee, the year and quarter of employment, occupation, and industry. This approach has the advantage of restricting the public-private sector earnings comparisons to individuals that are observationally similar. This is superior to the previous section where we only looked at average earnings without accounting for all of the ways in which private and public sector employees differ. We use the following equation to compare the earnings between public and private sector employees after accounting for some of the ways in which they differ.

$$ln(earnings)_{iqy} = \sum_{Y=2001}^{2016} (\beta_Y \cdot Public_{iqy}^{Y}) + \delta_1 \cdot t_{iqy} + \delta_2 \cdot t_{iqy}^2 + \gamma_1 \cdot A_{iqy} + \gamma_2 \cdot A_{iqy}^2 + Q_{iqy} + O_{iqy} + I_{iqy} + \epsilon_{iqy} \tag{1}$$

Equation 1 is a regression equation that helps us to characterize these differences in percentage terms. We do this by regressing the logged earnings on a dummy or indicator variable for public sector employment for every year ($Public_{iqy}^{Y}$), and include the control variables to restrict comparisons to individuals with similar characteristics. The outcome variable is the logged real earnings for individual i in quarter q of year y. Earnings are measured in 2016 dollars, and calculated based on the Anchorage CPI-U. By including a different indicator for public sector employment for every year from 2001 - 2016, we can track the gap across time. The estimated gap in public and private sector earnings in year Y is indicated by $\hat{\beta}_Y$. We calculate the gap in percentage terms using the transformation $e^{\beta_Y} - 1$. The estimated gaps are generally comparable to the unconditional gaps represented in Figures 4 - 6. The difference is that in this section we are considering earnings from all quarters and accounting for observable differences between public and private sector

employees.[3] Table 2 displays the estimated percentage differences in real earnings for public sector employees relative to private sector employees over our sample period. A positive number indicates a public sector premium, i.e. earnings are higher in the public sector relative to comparable employees in the private sector. On the other hand, a negative number means that public sector employees earn less than comparable private sector workers.

Table 2: Conditional Earnings Gaps Over Time

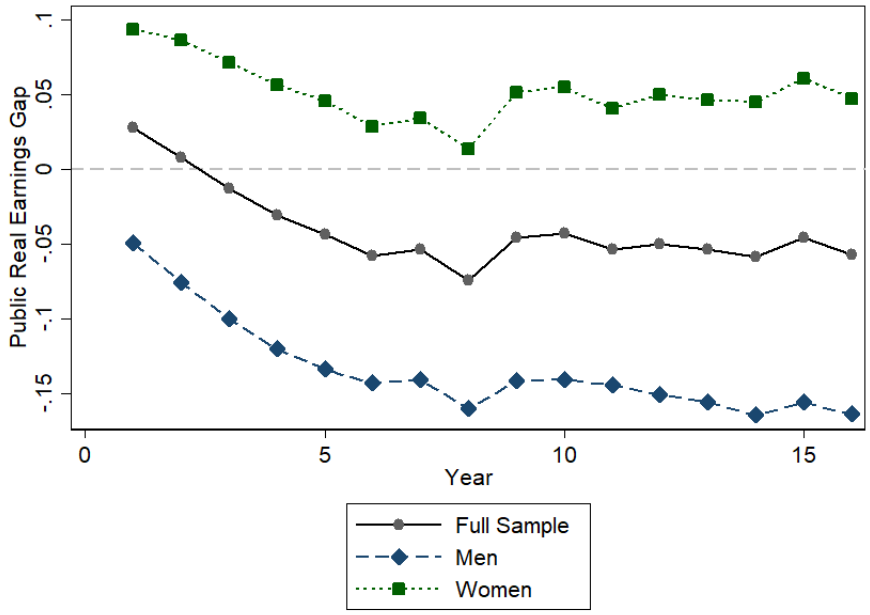
	Full Sample	Men	Women
2001	0.03	-0.05	0.09
2002	0.01	-0.08	0.09
2003	-0.01	-0.10	0.07
2004	-0.03	-0.12	0.06
2005	-0.04	-0.13	0.05
2006	-0.06	-0.14	0.03
2007	-0.05	-0.14	0.03
2008	-0.07	-0.16	0.01
2009	-0.05	-0.14	0.05
2010	-0.04	-0.14	0.05
2011	-0.05	-0.14	0.04
2012	-0.05	-0.15	0.05
2013	-0.05	-0.16	0.05
2014	-0.06	-0.16	0.04
2015	-0.05	-0.16	0.06
2016	-0.06	-0.16	0.05
N	15,216,466	7,990,048	7,226,418

Notes: Estimated real earnings gap for each year in the sample. Numbers are percentage differences for public relative to private employees. Positive estimates indicate a positive earnings gap for public sector employees, i.e. public sector employees earned more than comparable private sector employees. The number of observations differs from Table 1, because this comparison includes all quarters of the year.

Table 2 above makes it clear that the public sector discount has been persistent over the the last fourteen years, and that the gap grows during periods with high oil prices. The public sector raises are generally more structured, while the private sector is much more responsive to economic conditions. For example, the gap increased from 4% to 7% between

[3]The observable differences that we are controlling for are general time trends (t_{iqy} & t^2_{iqy}), age of the individual (A_{iqy} & A^2_{iqy}), quarter of the year (Q_{iqy}), occupation (O_{iqy}), and industry (I_{iqy}).

Figure 10: Conditional Earnings Gaps Over Time



Notes: This figure displays average real earnings gaps from Table 2.

2005 and 2008, then decreased back to 5% in 2009. The public sector discount stems entirely from males earning 13% to 14% less throughout the sample. Women in the public sector, on the other hand, earned more than women in the private sector throughout the sample period. In 2008, due to high oil prices and the corresponding increase in private sector wages, women in the public sector earned only 1% more than private sector women. However, this difference jumped to 5% in 2009, and has remained in the 4% - 6% range since.

4.2 Earnings Gap Over the Age Profile: Age 23 - 65

Since our data only contain information on workers in Alaska from 2001-2016, we do not observe the entire labor market history of each worker. In other words, we do not know how long a 50 year old had been associated with a specific firm or occupation in 2001. While this is a limitation, we use an analogous setup as the previous subsection to estimate a different gap at each age in our sample. This is important because people at different ages face different circumstances, and making comparisons at the same age is one way to restrict

our analysis to comparisons between similar individuals. We also control for differences in the industry and occupation that the individual works in. Since we do not view experience directly, age (conditional on industry and occupation) is essentially a proxy for experience.

Tables 3 and 4 shows these comparisons for men and women, respectively. From Table 3, the public sector discount is most pronounced among men under age 30, and smallest from age 50-58. In contrast to Figure 1, which shows unconditional differences by age, Table 3 suggests a much larger earnings gap for young workers. Figure 1 shows that younger public sector workers earn similar amounts to their private sector counterparts when averaging across all workers. However, that comparison does not account for the occupation and industry of the workers, so it may be misleading if, for example, there are low wage private sector occupations that are rare in the public sector. Table 4 shows that women enjoy a premium at most ages, with the most striking exceptions for the youngest and oldest workers.

Table 3: Real Earnings Gaps By Age (Men)

Age	Gap	Age	Gap	Age	Gap	Age	Gap
23	-0.42	34	-0.12	45	-0.11	56	-0.09
24	-0.35	35	-0.12	46	-0.11	57	-0.08
25	-0.29	36	-0.12	47	-0.11	58	-0.08
26	-0.25	37	-0.12	48	-0.10	59	-0.10
27	-0.23	38	-0.12	49	-0.08	60	-0.11
28	-0.19	39	-0.12	50	-0.07	61	-0.13
29	-0.18	40	-0.12	51	-0.07	62	-0.17
30	-0.16	41	-0.12	52	-0.06	63	-0.18
31	-0.13	42	-0.11	53	-0.07	64	-0.20
32	-0.13	43	-0.11	54	-0.07	65	-0.25
33	-0.12	44	-0.11	55	-0.08		

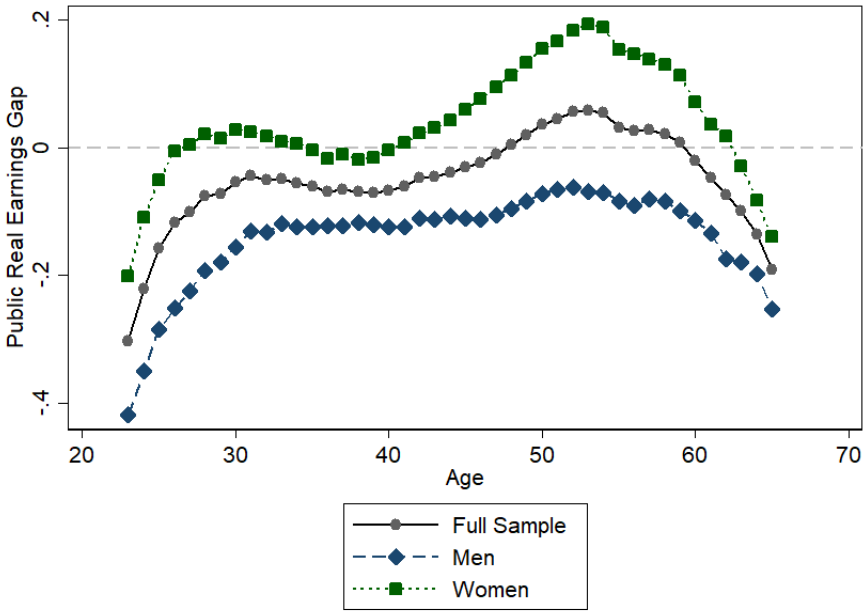
Notes: Estimated real earnings gap for each age in the sample. Numbers are percentage differences for public relative to private employees. Positive estimates indicate a positive earnings gap for public sector employees, i.e. public sector employees earned more than comparable private sector employees.

Table 4: Real Earnings Gaps By Age (Women)

Age	Gap	Age	Gap	Age	Gap	Age	Gap
23	-0.20	34	0.01	45	0.06	56	0.15
24	-0.11	35	-0.00	46	0.08	57	0.14
25	-0.05	36	-0.02	47	0.10	58	0.13
26	-0.01	37	-0.01	48	0.11	59	0.11
27	0.00	38	-0.02	49	0.13	60	0.07
28	0.02	39	-0.02	50	0.15	61	0.04
29	0.02	40	-0.00	51	0.17	62	0.02
30	0.03	41	0.01	52	0.18	63	-0.03
31	0.02	42	0.02	53	0.19	64	-0.08
32	0.02	43	0.03	54	0.19	65	-0.14
33	0.01	44	0.04	55	0.15		

Notes: Estimated real earnings gap for each age in the sample. Numbers are percentage differences for public relative to private employees. Positive estimates indicate a positive earnings gap for public sector employees, i.e. public sector employees earned more than comparable private sector employees.

Figure 11: Real Earnings Gaps By Age



Notes: This figure displays average real earnings gaps from Tables 3 & 4.

5 Growth Among Stayers

Table 5 compares earnings growth in consecutive years for the same individuals. This restricts the earnings comparisons to within individual growth in earnings, rather than comparing levels of earnings across all individuals.

Table 5: Real Earnings Growth (Percentages)

	Men			Women		
	Any Firm	Same Firm	Known Tenure	Any Firm	Same Firm	Known Tenure
Public	0.020	0.019	0.036	0.024	0.024	0.045
Private	0.016	0.013	0.018	0.014	0.011	0.016
N	1,029,254	983,558	639,276	992,190	950,239	617,629

Notes: Approximate average growth percentages by men/women, and by sample. The *Any Firm* columns refer to individuals who remained in the public or private sector from one year to the next, regardless of whether they switched firms. The *Same Firm* columns restrict to individuals who remain with the same employer from one year to the next. The *Known Tenure* column restricts to individuals who remained with the same employer, and we know the length of their current job spell with that employer, i.e. we view their first quarter of the job spell. All numbers refer to first quarter average year-over-year changes in earnings.

Column 1 of Table 5 shows the average growth rate for men in the public and private sectors for people that stay in their respective sectors, regardless of whether they switched employers. We find that men who remain in the public sector experience average yearly earnings growth of 2% over their tenure, while men staying in the private sector average 1.6% growth. Those average growth rates are slightly smaller for workers who stay with the same firm. For women, the pattern is similar. On average, women who remain in the public sector experience faster growth than women who remain in the private sector (0.024 vs 0.014). As noted above, we can only calculate tenure if we observe the first quarter of the job spell. After restricting to job spells with *Known Tenure*, we find an average yearly growth of 3.6% for men in the public sector and about 1.8% for men in the private sector. Among women with known tenure, public sector earnings grew at 4.5% on average, while the earnings of women in the private grew at 1.6% on average.

The apparent large increase in returns[4] to public sector earnings when remaining with the same employer after restricting to the employees for whom we know the level of tenure is driven by an increased proportion of that sample comprised of early tenure individuals. Earnings growth is substantially higher near the beginning of a job spell, especially in the public sector. We can see this by separating out the first year premium in each sector from the more consistent average increase in earnings over all years of tenure. The next table separates out the average yearly growth from the first year premium in the public and private sectors to make the comparison more clear.

Table 6: Real Earnings Growth (Percentages)

	Men		Women	
	Same Firm	Known Tenure	Same Firm	Known Tenure
Public				
First Year Premium	0.079	0.067	0.090	0.073
Average Growth	0.012	0.024	0.015	0.031
Private				
First Year Premium	0.039	0.035	0.033	0.029
Average Growth	0.007	0.010	0.006	0.009
N	983,558	639,276	950,239	617,629

Notes: Approximate average growth percentages.

Table 6 emphasizes the difference between early tenure earnings growth relative to the average over later years of tenure. To be clear, the *First Year Premium* is the additional first year growth relative to growth in later years of tenure, and *Average Growth* is the average post first year growth for those who remain with the same employer. We can see that the first year premium exists in both the public and private sector, but is much higher in the public sector. Restricting the sample to those with known tenure exacerbates the size of the *Average Growth* measures, because that sample is weighted more heavily toward early tenure individuals. Although the first year has the highest growth, growth is also higher than average in other early years. If we consider the sample of men for whom we know

[4]By returns, we mean growth associated with remaining at the same firm or same sector

tenure, we find that the average earnings growth for those who stay with the same employer is approximately 2.4% for those in the public sector and 1% for those in the private sector. However, if we focus on growth for all stayers, regardless of whether we know tenure in their current job, we find average growth of only 1.2% in the public sector and 0.7% in the private sector. The big difference in growth between sectors is between the first two full Q1 observations that we view an individual, i.e. the *First Year Premium*. The first year premium among men in the public sector is 7.9% when compared with all other individuals, regardless of whether we know their tenure. The analogous premium in the private sector is 3.9%. Growth and first year premiums are higher for women than men in the public sector, but slightly smaller for women than men in the private sector.

There are several important factors beyond the average growth rates presented in Tables 5 & 6. First, these are averages across all earnings and occupations. The numbers don't shed any light on the occupations with the highest growth or first year premium, and similarly don't shed any light on the actual size of the changes in earnings. For example, we don't know whether the faster growth is driven by high or low earners. Additionally, these numbers group all public sector employees together, so we can't tell whether these are driven by local[5] or state public sector workers. Finally, since these are percentage growth approximations, we should consider them in conjunction with initial earnings across sectors. The faster growth in the public sector might be misleading if the baseline earnings are lower. Below, we further investigate these differences.

Table 7 converts the differences presented in Table 6 to dollar amounts. The modest size of the yearly growth suggests that it is workers with relatively low initial earnings that are driving the first year premiums, i.e. first year growth rates in the public sector are much higher than the average growth, but the first year premium and average change in level earnings are more similar. That suggests that the large first year premiums are driven

[5]Evaluating state government employees separately leads to the same qualitative results. One exception is that women employed by the state government, on average, have higher initial earnings at the start of a job spell than their private sector counterparts.

Table 7: Real Earnings Growth (2016 $)

	Men		Women	
	Same Firm	Known Tenure	Same Firm	Known Tenure
Public				
First Year Premium	533.24	411.46	426.39	295.18
Average Growth	232.12	353.91	206.80	338.01
Private				
First Year Premium	445.65	392.16	290.94	251.32
Average Growth	355.44	408.93	196.64	236.25
N	983,558	639,276	950,239	617,629

Notes: Average changes in level real earnings, measured in 2016 $. The average first year change can be calculated from the addition of the Average Growth and First Year Premium.

by low earners, but that later growth is more reflective of the typical worker. Changes in earnings are similar between public and private workers, especially for men. For example, the average change in earnings for men is $232 for all stayers in the public sector and $355 for all stayers in the private sector, a reversal of the ordering in the growth rates. The difference in average growth is enough to reverse the first year growth, despite the larger public sector first year premium. By adding the premium with the average growth, we see that in level terms, the private first year change in earnings is actually larger than that of the public sector for men. This comparison reflects the large difference in initial earnings between public and private sector workers. On the other hand, women in the public sector have faster percentage and level growth in earnings. However, the level changes between public and private sector women are similar, relative to the percentage growth differences.

Because of the faster growth in early years, the numbers can be misleading since they are weighted toward early tenure observations. The averages include more observations for people in their first year than their second year, more observations of individuals in their second year than third year, and so forth. One way to get around this is to calculate a different average growth rate for each year of tenure, and average across the tenure-specific

growth rates. This effectively produces estimates that are not weighted by the number of individuals contributing to each year of tenure, and is more reflective of the earnings trajectory that we expect to see from an individual over time. The next table demonstrates this concept by showing tenure-specific estimates on earnings growth.

Table 8: Tenure Specific Estimates

	Men		Women	
Tenure	Public	Private	Public	Private
1	0.091	0.045	0.104	0.038
2	0.043	0.020	0.049	0.015
3	0.029	0.013	0.037	0.009
4	0.019	0.006	0.028	0.009
5	0.029	0.005	0.029	0.002
6	0.016	0.005	0.024	0.001
7	0.019	-0.003	0.025	0.009
8	0.001	0.001	0.019	0.004
9	0.012	0.002	0.013	0.012
10	0.019	-0.001	0.024	0.009
11	-0.005	-0.001	0.002	-0.007
12	0.005	0.007	0.017	-0.009
13	-0.008	0.018	0.005	0.005
14	-0.024	-0.019	-0.016	-0.011
Average	0.018	0.007	0.026	0.006

Notes: Average tenure-specific growth for men and women in the public and private sector.

It makes sense to use the averages over the tenure-specific returns in order to reflect the actual trajectory that an employee faces, rather than mis-weighting the path because averaging over individuals puts too much weight on early years of tenure for which there are large differences between the public and private sector. We can use this same idea to

consider the overall public-private initial earnings with average growth, as well as occupation specific initial earnings and growth for men and women.

Table 9: Starting Earnings and Growth (Men)

		Public		Private		Public - Private	
	SOC	Start	Growth	Start	Growth	Start	Growth
All		10,231.79	0.02	13,345.43	0.01	-3,113.64	0.01
Managment	11	17,131.25	0.03	25,478.02	0.02	-8,346.77	0.01
Operations	13	13,013.35	0.03	20,958.85	0.01	-7,945.51	0.01
Computer & Math	15	13,114.97	0.02	17,478.06	0.00	-4,363.09	0.02
Architecture ...	17	13,177.97	0.02	23,734.88	0.01	-10,556.91	0.01
Sciences	19	8,919.58	0.03	21,211.35	0.02	-12,291.77	0.02
Community ...	21	11,657.56	0.02	10,047.11	0.00	1,610.45	0.02
Legal	23	15,445.73	0.03	24,744.48	-0.00	-9,298.75	0.03
Education ...	25	10,244.92	0.02	10,111.51	-0.01	133.41	0.03
Art ...	27	9,721.76	0.03	11,015.97	0.00	-1,294.21	0.03
Health Pract.	29	19,259.81	0.00	24,722.62	0.00	-5,462.81	0.00
Health Sup.	31	9,622.88	-0.01	8,688.68	0.00	934.21	-0.02
Protective	33	11,041.24	0.02	10,474.29	-0.02	566.95	0.04
Food Prep & Service	35	6,545.48	0.03	6,258.72	0.01	286.76	0.01
Grounds Cleaning	37	5,818.78	0.02	6,739.12	-0.00	-920.34	0.02
Personal Care	39	4,622.19	0.04	6,493.19	0.01	-1,870.99	0.03
Sales	41	5,946.70	-0.01	9,540.75	0.01	-3,594.05	-0.02
Admin Support	43	8,128.13	0.02	10,611.50	0.01	-2,483.38	0.01
Farming ...	45	6,378.67	0.01	7,470.44	0.02	-1,091.77	-0.01
Construction	47	9,365.40	-0.01	15,008.66	-0.01	-5,643.25	-0.00
Installation ...	49	10,266.26	0.00	13,720.21	-0.00	-3,453.95	0.01
Production ...	51	8,381.35	0.01	13,102.07	0.01	-4,720.71	0.00
Moving	53	7,752.47	0.01	10,902.85	0.01	-3,150.38	-0.00

Notes: Average starting earnings and average of the tenure-specific growth estimates for Men in public and private sectors. Starting earnings estimate are based on all observations of the first complete first quarter of the job spell. The growth estimates are averages of the tenure-specific returns estimates for each occupation, i.e. Table 8 displays the tenure-specific estimates for the full sample.

For men, even though they experience faster growth on average in the public sector, initial earnings are much lower in the public sector as well. For example, the average public sector male started with $10,231 in first quarter earnings. After 10 years with a particular employer with 2% growth they would be earning about $12,470 in first quarter earnings, which is less than the starting first quarter earnings for the average private sector employee. In other words, the higher growth is not nearly enough to overturn the public-private sector pay gap, even after 10 years with the same employer. There is a lot of heterogeneity in starting gaps,

Table 10: Starting Earnings and Growth (Women)

		Public		Private		Public - Private	
	SOC	Start	Growth	Start	Growth	Start	Growth
All		8,077.79	0.03	8,838.12	0.01	-760.33	0.02
Managment	11	13,979.41	0.04	15110.78	0.02	-1131.37	0.01
Operations	13	12,136.81	0.03	14,070.50	0.01	-1933.70	0.02
Computer & Math	15	12,311.32	0.03	14,911.54	0.01	-2600.22	0.02
Architecture ...	17	10,900.20	0.02	18,107.80	0.03	-7207.60	-0.00
Sciences	19	9,674.87	0.03	15,208.76	-0.00	-5,533.89	0.03
Community ...	21	10610.18	0.03	9,294.53	0.01	1,315.65	0.02
Legal	23	13,620.09	0.03	15,467.03	0.00	-1,846.94	0.03
Education ...	25	7,518.81	0.03	7,024.91	0.01	493.90	0.01
Art ...	27	9,124.29	0.03	7,751.48	-0.00	1,372.82	0.03
Health Pract.	29	14,272.76	0.02	15,699.10	-0.01	-1,426.34	0.03
Health Sup.	31	8,108.93	-0.00	7,809.95	-0.00	298.97	0.00
Protective	33	4,741.06	0.02	8,139.88	-0.01	-3,398.81	0.03
Food Prep & Service	35	3,917.12	0.05	5,039.21	0.01	-1,122.09	0.04
Grounds Cleaning	37	4,768.12	0.02	5,379.81	-0.01	-611.68	0.03
Personal Care	39	3,253.58	0.02	5,683.54	-0.01	-2,429.96	0.03
Sales	41	4,217.48	-0.02	6,335.00	0.01	-2,117.52	-0.03
Admin Support	43	7,506.18	0.02	8,572.93	0.01	-1,066.75	0.01
Farming ...	45	7,405.08	-0.04	4,918.34	-0.01	2,486.74	-0.03
Construction	47	7,997.39	-0.00	11,568.77	0.02	-3,571.38	-0.02
Installation ...	49	6,815.49	0.02	9,869.43	0.00	-3,053.94	0.02
Production ...	51	4,233.75	0.01	6,392.81	0.00	-2,159.07	0.00
Moving	53	6,729.39	0.04	6,787.90	0.02	-58.51	0.02

Notes: Average starting earnings and average of the tenure-specific growth estimates for Men in public and private sectors. Starting earnings estimate are based on all observations of the first complete first quarter of the job spell. The growth estimates are averages of the tenure-specific returns estimates for each occupation, i.e. Table 8 displays the tenure-specific estimates for the full sample.

and for some occupations the gap is reversed. For example, for those in *Protective Services* (SOC 33) the public sector employees receive higher starting earnings, and faster growth. There are three other occupations for which this is true: *Community & Social Services*, 21; *Education*, 25; *Food Prep & Servce*, 35.

For women, the difference in initial first quarter earnings is much smaller (10%), $8077 for public employees compared to $8838 for private employees, when averaging accross all occupations. Growth is also 3% on average in the public sector for women, while it is only about 1% for women in the private sector. That suggests that on average, women in the public sector catch up to the average private sector employee after about 7 years with the same employer. The growth estimates are based on individuals who remain with the same employer over time, but do not condition on other characteristics. However, because the earnings growth for women is so much faster in the first couple years of tenure, they actually reach the earnings level of their private sector peers in a couple of years. This helps to explain the earnings gap reversal of the public-private pay gap for women compared to men, which is shown in Figure 6. Even though the growth in earnings is also faster in early tenure years for men in the public sector, the public-private gap in initial earnings is too much for the public sector men to quickly overcome.[6]

6 Concluding Remarks

We compare earnings of the Alaskan public and private labor sectors from 2001 - 2016. Public sector employees are older and more likely to be female, suggesting that failure to account for age and gender differences can lead to misleading conclusions. Our analysis sheds light on many aspects of the public-private gap. One of the important takeaways is that, although public sector employers experience faster average earnings growth, public employees generally earn less than their private sector counterparts at the beginning of a job

[6]To expand on the comparison of initial earnings and differential growth rates, we evaluate differences in initial earnings and in the 10th year of tenure in Tables 11 and 12, and Figures 12 and 13.

spell. The difference in initial earnings is greater among men, and leads to sustained gaps between public and private sector earnings for men. However, women in the public sector earn more then their private sector peers due to relatively similar initial earnings between the two sectors, along with faster earnings growth for public sector women.

Appendix A Earnings at Start and with 10 years of Tenure

Table 11: Starting and 10th Year Earnings (Men)

		Initial Earnings		10th Year of Tenure	
	SOC	Public	Private	Public	Private
All		10,231.79	13,345.43	13,425.98	14,641.01
Managment	11	17,131.25	25,478.02	22,362.86	32,509.01
Operations	13	13,013.35	20,958.85	19,208.94	25,627.73
Computer & Math	15	13,114.97	17,478.06	18,249.09	19,623.11
Architecture ...	17	13,177.97	23,734.88	18,561.29	28,448.17
Sciences	19	8,919.58	21,211.35	12,929.30	26,706.14
Community ...	21	11,657.56	10,047.11	14,909.17	10,333.27
Legal	23	15,445.73	24,744.48	22,404.04	25,098.02
Education ...	25	10,244.92	10,111.51	13,472.66	9,486.70
Art ...	27	9,721.76	11,015.97	12,245.20	11,627.12
Health Pract.	29	19,259.81	24,722.62	21,392.12	24,665.04
Health Sup.	31	9,622.88	8,688.68	7,865.64	9,151.97
Protective	33	11,041.24	10,474.29	15,455.90	11,339.19
Food Prep & Service	35	6,545.48	6,258.72	10,681.01	6,782.42
Grounds Cleaning	37	5,818.78	6,739.12	7,831.70	6,518.54
Personal Care	39	4,622.19	6,493.19	8,078.56	5,668.02
Sales	41	5,946.70	9,540.75	5,748.16	10,319.75
Admin Support	43	8,128.13	10,611.50	10,925.00	12,135.43
Farming ...	45	6,378.67	7,470.44	6,639.99	8,228.70
Construction	47	9,365.40	15,008.66	10,222.92	14,704.97
Installation ...	49	10,266.26	13,720.21	11,552.58	14,382.75
Production ...	51	8,381.35	13,102.07	10,470.12	14,480.74
Moving	53	7,752.47	10,902.85	10,215.81	12,350.97

Notes: Average starting earnings and estimated earnings after 10 years of tenure. Starting earnings estimate are based on all observations of the first full first quarter viewed. The tenth year earnings estimates are based on tenure-specific returns estimates for each occupation, i.e. Table 8 displays the tenure-specific estimates for the full sample.

Table 12: Starting and 10th Year Earnings (Women)

		Initial Earnings		10th Year of Tenure	
	SOC	Public	Private	Public	Private
All		8,077.79	8,838.12	11,384.00	9,837.92
Managment	11	13,979.41	15,110.78	19,769.74	19,695.47
Operations	13	12136.81	14,070.50	17,472.24	17,597.92
Computer & Math	15	12,311.32	14,911.54	16,707.83	18,292.25
Architecture ...	17	10,900.20	18,107.80	14,947.70	22,069.63
Sciences	19	9,674.87	15,208.76	12,804.02	17,464.20
Community ...	21	10,610.18	9,294.53	14,181.88	10,173.42
Legal	23	13,620.09	15,467.03	19,214.20	15,782.06
Education ...	25	7,518.81	7,024.91	11,101.87	7,961.39
Art ...	27	9,124.29	7,751.48	11,982.14	8,169.28
Health Pract.	29	14,272.76	15,699.10	17,848.21	15,854.36
Health Sup.	31	8,108.93	7,809.95	8,705.10	7,627.33
Protective	33	4,741.06	8,139.88	6,321.41	8,412.56
Food Prep & Service	35	3,917.12	5039.21	6,918.92	5,274.15
Grounds Cleaning	37	4,768.12	5,379.81	6534.50	5,695.35
Personal Care	39	3,253.58	5,683.54	4,000.63	5,058.56
Sales	41	4,217.48	6,335.00	5,450.36	6,990.33
Admin Support	43	7,506.18	8,572.93	10,376.15	9,860.79
Farming ...	45	7,405.08	4,918.34	2,528.53	3,763.13
Construction	47	7,997.39	11,568.77	6,601.10	12,396.60
Installation ...	49	6,815.49	9,869.43	8,010.58	10,790.42
Production ...	51	4,233.75	6,392.81	5,566.12	6,539.44
Moving	53	6,729.39	6,787.90	8,399.06	8,810.16

Notes: Average starting earnings and estimated earnings after 10 years of tenure. Starting earnings estimate are based on all observations of the first full first quarter viewed. The tenth year earnings estimates are based on tenure-specific returns estimates for each occupation, i.e. Table 8 displays the tenure-specific estimates for the full sample.