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Out of the Gate, but Not Necessarily Teaching: A Descriptive Portrait of Early-Career Earnings for Those Who Are Credentialed to Teach

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Abstract

Prior work on teacher candidates in Washington State has shown that about two thirds of individuals who trained to become teachers between 2005 and 2015 and received a teaching credential did not enter the state's public teaching workforce immediately after graduation, while about one third never entered a public teaching job in the state at all. In this analysis, we link data on these teacher candidates to unemployment insurance data in the state to provide a descriptive portrait of the future earnings and wages of these individuals inside and outside of public schools. Candidates who initially became public school teachers earned considerably more, on average, than candidates who were initially employed either in other education positions or in other sectors of the state's workforce. These differences persisted at least 10 years into the average career and across transitions into and out of teaching. There is therefore little evidence that teacher candidates who did not become teachers were lured into other professions by higher compensation. Instead, the patterns are consistent with demand-side constraints on teacher hiring during this time period that resulted in individuals who wanted to become teachers taking positions that offered lower wages but could lead to future teaching positions.

"Many educators have walked away in recent years and amid a dire shortage, few people want to fill their spots. … The problem, education leaders say, is not that [*sic*] a lack of people who could become teachers, but rather not enough people choosing it as a profession."

"Teachers Are Leaving and Few People Want to Join the Field: Experts Are Sounding the Alarm," by Christina Maxouris and Christina Zdanowicz, February 5, 2022, CNN.

1. Introduction

How much do individuals who train to become public school teachers earn both in the public school teaching profession and outside of it? This seemingly simple question is at the heart of debates about whether teacher salaries are high enough to entice prospective teachers into public teaching positions. It is also motivated by growing evidence that a large number of individuals who complete all the requirements for becoming a public school teacher never enter the public school teacher workforce. Understanding the workforce outcomes for these individuals is therefore central to ongoing efforts to address staffing challenges in public schools.

While questions about the competitiveness of teacher salaries are not new,[1] the issue of relative teacher pay has gained added salience in recent years (Garcia & Weiss, 2019; Liu & Aubrey, 2021). In 2018 and 2019, for instance, there were high-profile teacher strikes in multiple states in which pay was a central issue (Wolf, 2019). More recently, numerous stories and reports have suggested that the COVID-19 crisis and the economic recovery may be increasing teacher turnover and causing shortages (Bauerlein & Koh, 2020; Goldberg, 2021; Pandy, 2021; Singer, 2021; Steiner & Woo, 2021). These stories and reports tend to be framed around the preferences of teachers or prospective teachers and suggest that low teacher pay is a major obstacle to enticing people to choose teaching as a profession. A recent *New York Times* article, for instance,

[1] Indeed, the question of how the desirability of teacher pay affects teacher shortages was addressed in a RAND report published nearly 60 years ago (Kershaw & McKean, 1962).

highlighted a teacher candidate who began considering other careers because she "didn't want to start despising a career I had a passion for because of the salary" (Goldberg, 2021).

There is general agreement that teachers ought to earn more; over 70% of survey respondents from the general public supported increases in teacher pay in a 2019 survey (Henderson et al., 2020).[2] There is also broad consensus that teachers' pay has stagnated over time relative to pay levels in the private sector for college-educated employees (Allegretto & Mishel, 2020; Hanushek et al., 2019). But these conclusions are based on comparisons between the earnings of teachers and non-teachers regardless of whether non-teachers had a substantive interest in teaching in the first place.

Importantly, there is nearly no empirical evidence on the relative earnings of teachers and non-teachers *among individuals with a substantive interest in teaching*. Given ongoing teacher shortages and the fact that individuals who have already trained to be teachers are clearly the lowest hanging fruit in terms of recruiting new teachers, better understanding the reasons that these candidates do or do not become teachers is a pressing policy need. In particular, recent evidence has documented that a substantial percentage of individuals with the right credentials to teach do not enter the teacher workforce (Cowan et al., 2016; Goldhaber et al., 2022). We cannot know for sure the reasons that people do or do not end up as teachers, as we only observe individuals in a teaching position when there is a match between their wage and working condition preferences and school districts' teacher attribute preferences (Boyd et al., 2013). But investigating the relative earnings of those who are credentialed to teach but do not end up as teachers can help us understand why we do not observe them as teachers. If, for instance,

[2] But there is also evidence that the public believes teachers are paid less than they actually are. When respondents were informed about actual teacher pay in their home state, the proportion of respondents who support increasing pay dropped to 56%.

credentialed individuals who are not teaching are earning substantially more in non-teaching positions, we might infer that they are lured away from the teacher labor market; hence the "bench" of potential teachers may be much shorter than it would appear based on aggregate numbers alone.

In this paper, we use data on over 14,000 teacher candidates from Washington State who student taught between 2005 and 2015, linked to state unemployment insurance (UI) data on the employment outcomes and earnings of these candidates after they graduate and receive a teaching credential, to provide a descriptive portrait of the earnings of individuals who are trained and credentialed to teach and are employed either as public school teachers or in other sectors of the Washington State economy (i.e., those sectors covered by the state's UI). By considering this relatively narrow sample of individuals who expressed a clear interest in teaching by completing the requirements for a teaching credential, we are not trying to weigh in on broader debates about teacher compensation relative to the compensation in other professions. Instead, this analysis targets the much narrower question of whether individuals who are trained to teach but did not become teachers may have been lured away from the teaching profession by higher salaries in other professions. This is, to our knowledge, the first large-scale empirical study investigating this specific question.[3]

We find that teacher candidates who became public school teachers during this time period initially earned nearly twice as much, on average, as candidates who were initially employed either in other educational positions (e.g., as substitute teachers in public schools and

[3] Previous research has used survey data to report on the occupations and earnings of college graduates (Cominole et al., 2021) or the decision to teach by those who had indicated various levels of interest in teaching during college (Staklis & Henke, 2013), but there is no assessment of early-career earnings for a large sample of individuals who are credentialed to teach.

teachers in private schools) or in other sectors of the state's workforce. These differences narrowed but persisted at least 10 years into the average career and are robust to transitions into and out of teaching. For example, candidates' earnings tended to increase significantly when they moved into public teaching positions and decrease significantly when they moved out of public teaching positions. The patterns we document are consistent with demand-side constraints on teacher hiring that resulted in individuals who wanted to become teachers taking lower earning positions that could lead to future teaching positions as well as movements out of teaching for reasons other than higher compensation.

2. Literature on Relative Teacher Compensation

There are several challenges to understanding the relative competitiveness of teacher compensation. First, the overwhelming majority of teachers are paid according to a salary schedule that links pay to experience, educational attainment, and credits, and this schedule is generally specific to states or school districts (Walsh, 2014). Consequently, average teacher pay will strongly reflect the experience and credential profiles of teachers in the workforce. Second, pay is only a portion of overall *compensation*, and teacher compensation tends to be back-loaded compared to compensation in the private sector; that is, a larger share of compensation devoted to teachers supports their retirement pay and health benefits (Aldeman, 2019; Costrell, 2020; McGee & Winters, 2017; Podgursky & Tongrut, 2006). Finally, teachers' work is structured around the school year, so there are disagreements about both the accuracy of reported hours worked and how to handle adjustments for the number of hours that teachers work in teaching and non-teaching jobs during the summer (Blackburn, 2021; Richwine & Biggs, 2013; West, 2014).

The literature investigating teacher and non-teacher compensation reaches somewhat divergent conclusions about the extent to which teacher compensation compares favorably to compensation for *similar* employees in other occupations.[4] Several studies that adjust wages for degree level and the relevant labor market find little difference in relative pay (Richwine & Biggs, 2011; West, 2014), while others find that teachers tend to earn roughly 10% less (Taylor, 2008) to 20% less (Allegretto & Mishel, 2020). As noted above, these different conclusions may reflect different decisions about how to adjust for issues like reported hours worked.[5]

A key issue that arises in assessing relative teacher pay concerns the measures used to determine the comparability of employees. All studies adjust for experience and degree level, but the findings are also sensitive to the inclusion of measures of academic skills. This is not surprising given evidence that while most teacher pay scales strongly reward degree attainment and experience, there is likely less reward for increases in measured academic skills in teaching than in the private sector (Goldhaber & Liu, 2003; Walsh, 2014). Moreover, because of individuals' self-selection into occupations, the people in each occupation may differ from one another in unobserved ways (Bacolod, 2007; Rickman et al., 2019; Stinebrickner, 2001).

One approach to investigating relative earnings that helps to account for self-selection into teaching is to assess how much teachers earn when they transition to alternative (non-teaching) occupations. Interestingly, and somewhat at odds with the findings of teacher pay gaps, Feng (2014) found evidence that former teachers did not, on average, earn more after leaving the teacher labor market.[6] Chingos and West (2012) reach a similar conclusion but, consistent with

[4] See Liu and Aubrey (2021) for a recent review of the evidence. For a more extensive discussion of the influence of different statistical adjustments when comparing teachers and non-teachers, see Blackburn (2021).
[5] Study timing may also be an issue, as there is greater consensus that teacher pay has declined over time, and the most recent study that finds the largest pay differential between teachers and non-teachers.
[6] Though here too timing of the data collection could matter, as this is work based on data that are more than a decade old.

the evidence that there are greater rewards for productivity in the private sector, also found that former teachers who were more effective (based on their value added) earned more outside of teaching than less effective former teachers. And Goldhaber and Player (2005) found that former teachers credentialed to teach math and science at the secondary level earned more than those credentialed to teach at the elementary level.

Most closely related to the research we describe here is research on earnings for teachers and non-teachers that describes differences in the returns related to individual background characteristics and hence the opportunity costs associated with becoming a teacher. Both Goldhaber and Liu (2003) and Walsh (2014) use national survey data to estimate earnings for recent college graduates. Given differences in the rewards related to individual characteristics in the teacher and non-teacher labor markets, both studies conclude that while, on average, there is not a significant earnings penalty from choosing a teaching career, individuals with higher college entrance test scores and math and science training face relatively large opportunity costs to teach because the teacher labor market rewards these characteristics at lower rates than non-teacher labor markets.

We contribute to this literature by focusing on large cohorts of teacher candidates who are interested enough in teaching to have completed a teacher education program and received a teaching credential to teach in Washington State. This particular sample builds on previous research in various ways. First, survey data snapshots taken at various times may not provide a good sense of who is becoming a teacher year to year, nor of the consistency of any earning differentials across time. There is little evidence of how earnings change for people who transition *into* teaching positions, and these data allow us to track such annual transitions into

and out of teaching, which Goldhaber et al. (2022) show are quite common in the first decade after graduation.

Second, many studies ignore the issue of teachers holding second jobs. Ignoring so-called moonlighting by teachers is an important omission because, as we show below, a significant share of teachers do hold second jobs, particularly in the summer months. Third, many of the aforementioned studies focus on college graduates irrespective of their eligibility to teach. In their work on teacher licensure, for example, Cowan et al. (2020) and the National Council on Teacher Quality (2021) show that significant proportions of teacher candidates, over half in some states and subject areas, fail to pass required licensure tests. By focusing solely on candidates who completed licensure requirements, we avoid conflating candidates' ability to meet licensure requirements with their subsequent employment outcomes.

3. Data and Analytic Approach

We utilize three sources of data for this work. The first is information on teacher candidates provided by 15 Washington State teacher education programs participating in the Teacher Education Learning Collaborative (TELC).[7] The TELC data include information about when and where each teacher candidate's student teaching occurred. For the purposes of this analysis, we focus on teacher candidates who student taught between 2004–05 and 2014–15. Importantly, we limit the sample to candidates who completed their student teaching *and received a license to teach in Washington State*. Thus, we focus on the employment outcomes of

[7] Institutions participating in TELC include Central Washington University, City University, Evergreen State College, Gonzaga University, Northwest University, Pacific Lutheran University, St. Martin's University, Seattle Pacific University, Seattle University, University of Washington Bothell, University of Washington Seattle, University of Washington Tacoma, Washington State University, Western Governors University, and Western Washington University.

teacher candidates who appeared to have a strong desire to teach and had obtained the legal credentials necessary to become public school teachers in the state.

The 15 TELC programs in this data set supply about 80% of new teachers who are prepared in Washington State, but they are not representative of the state as a whole (Goldhaber et al., 2020). TELC programs prepare over 90% of all new in-state prepared teachers west of the Cascade Mountains but less than 60% of all new in-state prepared teachers east of the Cascade Mountains.[8] Institutions participating in TELC also tended to have a higher percentage of teacher candidates of color graduating during these years of data (9%) than institutions not participating in TELC (6%).

We merge the TELC data to public school employment records maintained by Washington's Office of Superintendent of Public Instruction (OSPI). Specifically, OSPI uses the S-275, an annual reporting process, to collect employment data, including classroom assignments and related earnings, for all certificated public school employees in the state who were employed as of October 1 of each school year.[9] These data include information on public school employee positions that allows us to create indicators showing whether each candidate was employed in a teaching position or other certificated position in each school year after they completed student teaching.[10]

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[8] We do not have information on the graduates of six (non-TELC) teacher education programs that were certified to train new teachers during the years we consider. These six programs disproportionately serve school systems in Eastern Washington, and the 15 TELC programs disproportionately serve Western Washington.

[9] Thus, the OSPI data would not include information on individuals who were not hired until after October 1 of a given school year. There is little evidence about how prevalent this type of employment is, but a recent report on teaching vacancies in Washington districts (Goldhaber & Gratz, 2021) suggests that probably less than 2% of teachers are hired after October 1.

[10] Specifically, by leveraging the activity, program, and duty root codes, we can differentiate between teachers and other public school employees (i.e., administrators, aides, and other certified employees). Unfortunately, the OSPI data do *not* systematically track substitute teachers, so we cannot observe whether they are teaching in that capacity in public schools. This turns out to be an important limitation, as we suspect that many of the individuals who do not immediately find employment after being credentialed serve as substitutes in districts until new teaching slots open up (Goldhaber et al., 2022). However, we can identify public schools as employers for whom at least 50% of their

The above data were then merged with data maintained by Washington State's Education Research and Data Center (ERDC), which is the state agency tasked with maintaining the state's P–20 data warehouse. Key for the work described here, the ERDC data have information on employment outcomes, including quarterly earnings, hours worked,[11] and North American Industry Classification System (NAICS) employment sectors for all individuals employed in occupations covered by Washington State UI.[12] These UI data generally exclude individuals who are self-employed or in the military but otherwise provide comprehensive coverage of employment outcomes in Washington State from 2006 to 2018.[13]

The UI data provide our primary measures of candidates' earnings and hours inside and outside of public schools because they are collected for all candidates employed in positions covered by the UI program.[14] But for the subset of candidates hired into public teaching positions, we can better understand their earnings using three different sources: (a) teaching jobs in public K–12 schools, (b) non-teaching education service jobs in public K–12 schools, and (c) sectors outside of public K–12 schools. Therefore, the data allow us to observe, in any given

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employees appeared in the state's public school employment records. This allows us to capture two predominant types of public school employment in a single category: (a) non-certificated public school employees like substitute teachers and (b) employees who were hired after the October 1 deadline for the state's public school employee data collection.

[11] For some people, reported hours are either missing or are unreasonably low or high. We exclude people who, in a given year, worked more than 1.5 times full-time (i.e., 3,150 hours) and those who worked less than one-quarter time (i.e., 525 hours) while also having wages above $100 per hour. These restrictions affect 0.5% of our total sample. Another 1.5% observations had zero hours, which we coded as missing and therefore do not include in the analyses.

[12] One limitation of using the NAICS codes from the UI data is that for people we identify as teachers (using information from OSPI's employment records), we cannot parse earnings from teaching and earnings from non-teaching. This is because the NAICS codes are only reported for a broad sector, "Education Services," and not for any specific jobs within that sector.

[13] Independent contract workers make up a small but growing part of Washington State's workforce. Between 2008 and 2016, independent contracting in the state increased by 15%, and by 2019 self-employed individuals made up about 9% of the state's workforce (Washington State Department of Commerce, 2019).

[14] Hours and earnings are reported quarterly by employers for employees covered under the state's UI program (for tax purposes). As a quality check, the state's Employment Services Division conducts an annual audit on a sample of employers' data submissions, looking for organizations that might be manipulating data so as to reduce unemployment taxes (Jeff Robinson, personal correspondence, June 17, 2020).

year, how much an individual makes as a teacher, how much they make from all education service jobs (including teaching), and how much they make from all jobs (including those outside of public K–12 education).[15]

To create the analytic data file for this analysis, we first collapse the UI data to the school year level by collapsing across quarters within a school year.[16] For candidates who were employed in more than one sector in a given school year, we keep the sector from which the candidates received the highest earnings and assign their total inflation-adjusted annual earnings—converted to 2020 dollars—to that sector.[17,18] We consider someone to be a public school teacher (henceforth "teacher") if they had *any* earnings from public school teaching during a school year, even if teaching was not their highest paying job.[19,20]

The final data set we use for analysis includes 14,175 teacher candidates who student taught between the school years 2004–05 and 2014–15 and can therefore be observed for at least 3 years after they completed student teaching (i.e., through the end of the 2017–18 school year). For each candidate and year following student teaching, we define four employment categories:

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[15] One might assume that, when aligned, these three sources of earnings show that, on average, earnings from only teaching are lower than earnings from teaching plus all other education service positions, which are in turn lower than earnings from all jobs. This, however, is not the case. In fact, the earnings reported from OSPI for all education service positions are systematically higher than the total annual earnings reported in the UI data, which include education service jobs and any jobs in other sectors. This could be because we cannot exactly match quarterly wages with school-year earnings because the latter reflect earnings from one September to the next, making our annual match one month off, or because some sources of teachers' earnings are not covered by UI.

[16] To measure earnings for the 2009–10 school year, for example, we use earnings from Quarter 4 of 2009 and Quarters 1, 2, and 3 of 2010.

[17] Nearly half of candidates (48%) received earnings from more than one employment sector in at least 1 year. Across all years, 15% of person-year observations were of candidates who received earnings from more than one employment sector. The difference between what candidates who were employed in multiple sectors earned from their highest-paying job and their total annual earnings is about $5,200 for all candidates and $5,600 for teachers.

[18] Candidates' primary employment sector does not change substantially if we use the highest number of reported hours worked instead of highest earnings.

[19] Nearly all (99.6%) of the teachers in our sample received the majority of their annual earnings from teaching in K–12 public schools. In the first year after graduation, for example, only 34 teachers received most of their earnings outside of teaching. In any given year, this number never exceeds 36 teachers.

[20] We cannot determine if individuals are employed in private school teaching positions and henceforth use the term "teacher" to mean employment as a public school teacher.

(a) "Teachers" (candidates employed in K–12 public schools as teachers); (b) "Education Services" (candidates employed in education but not in a public school teaching role);[21] (c) "Other" (candidates employed outside of education);[22] and (d) "Not in UI Data" (candidates who are not in the UI data either because they are employed in a position that is not covered by UI, are employed out of state, or are not employed at all).[23] **Table 1** shows the sample sizes we observe for each year after teacher candidates do their student teaching. As in Goldhaber et al. (2022), we see the share of teacher candidates in teaching positions rises over the first few years after student teaching is completed (from about 41% in Year 1 to nearly 56% in Year 4). There is a notable drop in the share of teacher candidates who are employed in education services (but not as teachers), as many of those are transitioning into teaching positions. There is also a sizable jump across years in the proportion of teacher candidates who are not included in the UI data at all (from about 10% in Year 1 to nearly 30% in Year 10).

Because this analysis focuses on earnings and wages—which we cannot observe for individuals who are not in the UI data—we focus only on the first three categories for the remainder of this analysis. In the first year after student teaching, for example, the sample consists of 12,742 teacher candidates.[24] In subsequent analyses that track candidates over their early careers, we use observations for all candidates for any year in which they are observed.

[21] These include non-teaching public K–12 jobs like those held by administrators, aides, other certified employees, substitutes and late hires as well as education positions outside of public schools like those held by private school teachers and tutors.

[22] The most common job sectors for teacher candidates in this category are Health Care and Social Assistance, Accommodation and Food Services, Retail Trade, Arts/Entertainment and Recreation, and Public Administration.

[23] We are primarily interested in detailing how earnings from teaching compare to earnings from other employment while keeping such comparisons parsimonious. Therefore, we leveraged job-specific employment information from OSPI to distinguish between teaching and non-teaching jobs within the broader education services sector while grouping all jobs outside of education into a single category.

[24] Our samples change slightly from year to year as candidates move in and out of the UI data. We include candidates who appear in any given year. In other words, candidates do not have to appear in every year to be included in analyses focused on any given year.

Notably, our sample size decreases over time. Five years after graduation, for example, we observe 10,195 candidates, and 10 years on we observe only 4,171 candidates.

The next section discusses our analysis of these data. In addition to reporting basic summary statistics, we use the coefficient of variation (CV) and two-tailed two-sample Kolmogorov-Smirnov (KS) tests to investigate how the distributions of earnings or wages of teachers compare to those of non-teachers.

4. Descriptive Portrait of Early-Career Earnings (for Those Credentialed to Teach)

In Section 4.1 we describe the *earnings* of teacher candidates in their first year after being credentialed. In Section 4.2 we transition to describing differences in first-year hourly earnings (or wages) across sectors. As Goldhaber et al. (2022) noted, there were significant percentages of individuals who moved from one sector of employment to another, particularly individuals who were employed by public school systems but not as K–12 teachers, in the first 10 years after being credentialed. Thus, in Section 4.3 we focus on the growth in wages in the decade after teacher candidates were credentialed, and in Section 4.4 we focus on the change in wages associated with transitions into and out of teaching. Finally, in Section 4.5 we explore the heterogeneity in the findings for different employment categories outside of education to test the robustness of these patterns.

4.1. First-Year Earnings by Sector of Employment

In **Figure 1**, we focus on the first-year earnings of teachers (Panel A) and non-teachers (Panel B), which combine the "Education Services" and "Other" categories described in the previous section. The three distributions in Panel A are additive and represent the earnings *of the same sample of teachers* from three different sources: (a) only K–12 teaching positions ("Base

Teaching Salary"); (b) K–12 teaching positions plus compensation from within public K–12 school districts derived from supporting other student activities, such as serving as a coach or tutor ("Total Earnings From Public K–12 System"); and (c) both of these sources of earnings plus earnings from outside K–12 public school systems ("Total Annual Earnings"). Panel B provides comparable distributions for non-teachers, none of whom have a base teaching salary but some of whom received at least some compensation from public schools (e.g., as a substitute teacher or late hire).

The most notable pattern in **Figure 1** is that the average candidate who enters a public teaching position in the year after student teaching earns about twice as much as the average candidate who does not. Pooled across sources of earnings, the average teacher earned $49,939 in their first year after student teaching, while the average non-teacher earned only $24,560. In addition, the total first-year earnings of teachers are much more tightly distributed than those of non-teachers, whose distribution is skewed to the right.[25] So, for example, 89% of teachers earned more than $40,000 whereas only 18% of non-teachers earned at least that much. Conversely, two thirds of non-teachers made less than $30,000 while only 5% of teachers did so.

Most of the first-year earnings for teachers came from their base teaching salary (dotted line), but nearly all teachers (98%) also had supplemental earnings from other responsibilities within the public K–12 system (dashed line indicates base salary plus supplemental school district earnings),[26] and a smaller share of teachers (20%) had extra earnings from non-education

[25] CVs of total annual earnings is 23 for teachers and 68 for non-teachers. A KS test showed significant differences in these distributions at the .001 level.

[26] Until a recent Supreme Court decision that affected teacher pay in the state (McCleary v. State of Washington, 2018)—and for all the years of employment and earnings data included in this paper—teachers in Washington were paid according to a statewide single salary schedule that could be supplemented by local levy dollars, aka TRI (Time, Responsibility, Incentive) Pay. While this source of earnings was supposed to be for extra duties, some school systems used this as an add-on to regular compensation, and it is, unfortunately, not possible to decipher from the data which earnings are for teaching and which are for extra duties (Goldhaber et al., 2016).

jobs (solid black line indicates earnings from all sources). First-year teachers' average base salary was $38,400. Additional compensation from within the public K–12 system increased teachers' average earnings by about $10,600—or roughly 28% of the average base teaching salary. And earnings by teachers who also worked in *non-education-service* jobs increased the average by an additional $900—or roughly 2% of their total earnings from the public K–12 system.[27]

Unfortunately, we cannot tell from the data whether teachers with multiple sources of earnings represent teacher earnings from non-teaching jobs that individuals held before or after being employed as teachers or jobs that they held while simultaneously being employed as teachers (i.e., moonlighting; Ballou, 1995; Tate, 2022). By considering the quarter of employment, however, we see evidence consistent with the notion that some teachers are working additional jobs while holding teaching positions. In particular, we focus on employees who reported being employed at the same "stable" job in their first year after graduation.[28] We examine the proportion who also had earnings from one or more *other sectors* in any quarter[29] as

[27] This difference gets smaller over time for teachers. In the 10th year after graduation, on average, teachers earned an additional $480 from non-education-service jobs, or less than 1% of teachers' total earnings from the public K–12 system in that year. In **Figure 1a** of the Appendix, we show that teachers who received any compensation outside of education in their first year of teaching (nearly 20%, which is a percentage consistent with other research on teachers' non-teaching employment; see Garcia & Weiss, 2019) earned about $4,900 more on average, or roughly 10% of their total annual earnings. Moreover, for this subsample the additional earnings increased over time. Five years out, teachers with at least one non-teaching job earned an additional $6,250 (or 12% of all teachers' annual earnings). Ten years out, such teachers earned an additional $7,750 (or 14% of all teachers' annual earnings).

[28] Following recent work from the U.S. Census Bureau (Bailey & Speltzer, 2020), we consider someone as having held a stable job if they were employed by the same employer in each consecutive quarter of the school year beginning after graduation (i.e., Q4 [fall] of the year they graduated through Q3 [summer] of the following calendar year).

[29] As mentioned in Section 3, using OSPI's employment data allows us to parse out more specific jobs for candidates employed in the education service sector (e.g., teachers, aides, administrators, and other certified employees). However, we cannot do the same for people employed in other sectors. Therefore in order to more fairly compare multiple-job holdings of teachers and non-teachers, we require that an individual's additional job must be in a sector different from that of their primary—or highest paying—stable job. So, a stably employed teacher who also held another teaching position or one who also held a position as an educational aide *is not* considered to have held an additional job. In contrast, a stably employed teacher who also worked in health care or professional services *is* considered to have held an additional job.

well as the average number of hours worked in those secondary jobs.[30] Across cohorts, teachers were more likely to be employed in stable jobs (92%) than non-teachers (63%) their first year after student teaching. Panel A of **Figure 2** shows the percentage of stable teachers who worked additional jobs and their average non-teaching hours, per quarter; Panel B shows the equivalent for stable non-teacher employees.[31]

Interestingly, teachers were far less likely to work a second out-of-sector job (or more than a single additional job) at any point during their first year (9.8%) than non-teachers (27.4%), and they worked fewer hours in those additional jobs. In fact, the prevalence of holding multiple jobs among teachers is generally in line with broader job employment trends (Bailey & Speltzer, 2020; Beckhusen, 2019, Fitchett et al., 2016).[32] This is not so for non-teachers in our sample, who were nearly 3 times more likely to have held multiple jobs in their first year. Consistent with the idea that there are a number of individuals on the teacher bench, many of these non-teachers (nearly 70%) were stably employed in teaching adjacent positions. As we discuss below, these are relatively low paying positions (such as substitute teacher, aide, and private school teacher), but they are also positions that may serve to further a transition into teaching (Goldhaber et al., 2022).[33]

[30] For those people with two or more stable jobs (8.5%), we treat their highest paying stable job as their primary job and any other job(s) as secondary.

[31] In **Figure 2a** of the Appendix, we relax the stable job restriction on the samples and show the results for teachers and non-teachers to be largely the unchanged.

[32] Estimates of multiple jobholding rates in the United States during the years covered by the data (i.e., 2006–2018) range from 7.0% to 8.3% of all employed individuals, with slightly higher rates (7.5% to 8.6%) for those aged 25 to 34 (Bailey & Speltzer, 2020). And Beckhusen (2019) reports that, in 2013, multiple jobs were held by 13.4% of women in education-related occupations.

[33] Over time, the rates of holding out-of-sector secondary jobs dropped for both teachers and non-teachers, suggesting that candidates had begun to settle into a single job. In **Figure 3a** of the Appendix, we show annual rates of multiple job holding for teachers and non-teachers over the first 10 years after graduation. The rate for non-teachers dropped faster (by 72%) than for teachers (by 55%), so that by 10 years out the *difference* in rates between the two groups had decreased 70%, from about 17 to 5 percentage points.

It is also interesting to view the timing of multiple jobs during an individual's first year after being credentialed. Both teachers and non-teachers are more likely to hold multiple jobs in the summer quarter, but the increase in the proportion of teachers holding multiple jobs in the summer (55% relative to the average of the three other quarters) is far higher than for non-teachers (18%).[34]

4.2. First-Year Wages by Sector of Employment

One concern with the trends documented in Figure 1 is that they may reflect differences in hours worked for teachers and non-teachers rather than their wages in these positions. In **Figure 3**, we plot the number of total hours worked in the first year after being credentialed. There are differences in both the means and distributions across these sectors, though not as stark as the differences for earnings. On average, those employed as teachers worked 269 more hours (or about 5 more hours per week) than non-teachers. The variation in the distribution of reported hours worked is also considerably larger for non-teachers than teachers.[35] These figures for hours are broadly consistent with evidence for teachers from the American Time Use Survey (West, 2014).

Figure 4 shows the average hourly wages (as opposed to earnings) of all first-year candidates employed as teachers after graduation (Panel A) and in a non-teaching sector (Panel B). As was the case for earnings, teacher wages were significantly higher (about 54% higher) than the wages of those employed in other sectors, and we also see greater variation in earnings

[34] Moreover, for first-year teachers, the summer yielded the highest average earnings of any quarter (see **Figure 4a** of the Appendix). The average earnings for each of the four quarters were between $900 and $1,200.

[35] The CVs for distributions of hours worked are 19 for teachers, 52 for individuals in education services, and 53 for individuals in other sectors. KS tests of the differences between the distribution of hours worked by teachers and those worked by either people in education services or in other sectors are significant at the .001 level.

outside of teaching.[36] In this comparison we use the total earnings of those employed as teachers (and non-teachers) regardless of whether earnings were derived from employment outside of teaching. Interestingly, there is little difference in the findings when we make teacher to non-teacher comparisons restricting teacher wages to those received from either all education services (which do include supplements from non-teaching positions) or from teaching only (the difference is shown in Panel A of Figure 4 as the difference between the dotted and solid lines).

4.3. Early-Career Wages and Earnings by Sector of Employment

The results to this point have focused on earnings and wages in the year immediately following student teaching, but it is possible that candidates employed outside of teaching have better employment outcomes and wages over time than teachers do. In **Figure 5** we therefore report on changes in wages over time by sector for the first 10 years after teacher candidates are credentialed.[37] As was the case for first-year wages, teachers continue to have higher average annual wages throughout the early part of their careers. The gap between the average wages of teachers and non-teachers employed in education services hovered around $11, whereas the gap between teachers and non-teachers employed in other sectors was slightly larger (around $16). That said, these gaps did narrow somewhat over time, as the wage growth from Year 1 to Year 10 was 36% for those employed in teaching, 55% for those employed in the education services sector as non-teachers, and 64% for those employed elsewhere in the UI-covered sectors of the Washington State economy.[38] Thus, we do find some evidence that the salaries of teachers

[36] CVs for the distribution of wages for teachers is 17 and 36 for non-teachers. A KS test of the differences in the distributions of wages between teachers and non-teachers is significant at the .001 level.

[37] Individuals are classified based on the sector in which they are employed in a given year.

[38] The CVs for annual wages increase over time (i.e., from Year 1 to Year 10) for all sectors but much less so for teachers (17 to 20) than for non-teachers in education jobs (30 to 42) or people employed outside of education (48 to 55). For comparison purposes, in **Figure 5a** of the Appendix we again plot wages by sector over time and include the subsample of people who were never employed in education services during the first decade after graduation. In each year, this group earned slightly higher wages than people employed in the "Other" category who could have

increased more slowly than the salaries of those who trained to be teachers but ended up employed in non-teaching positions, though not enough to offset the large differences in initial salaries even after 10 years.

We also see differences across sectors in annual hours worked in the 10 years after individuals are credentialed. In particular, while the variation in hours worked increased over time for all groups, the spread was much smaller for teachers in any given year (ranging from 19 in Year 1 to 40 in Year 10) than for either non-teachers in education jobs (from 52 to 69) or people who worked outside of education (from 53 to 61). Hence, a comparison between annual earnings by sector over time (reported in **Figure 6a** of the Appendix) shows a small decrease in the difference between teachers and non-teachers (in either employment category) from about $24,000 in Year 1 to about $15,000 in Year 10. Despite a closing earnings gap, teachers still had an earnings advantage equivalent to more than one third of the average annual salary for those employed in non-teaching positions.[39]

4.4. Wages of Those Who Transition Between Sectors

In Section 4.1 we discuss first-year earnings for newly credentialed teacher candidates, but as has been documented (Goldhaber et al., 2022), there is considerable switching of teacher candidates out of and especially into teaching positions in the first few years after individuals received a teaching credential. For instance, we observe that in the second year after

transitioned in and out of education sector jobs over the years of observation. We find substantively small but statistically significant differences in the annual wage distributions of these two groups; KS tests of wage distributions for these groups in any given year are each at least significant at the .05 level. The CVs of distributions for these 10 years start at 52 (in Year 1) and range from a low of 49 (in Year 3) to a high of 61 (in Year 9). Also note that it makes very little difference whether the definition of "never employed in education" includes only those we can observe in non-education-service sectors (i.e., the "Other" category) over the years or also includes people who come in and out of UI data to and from employment in non-education-service jobs. In no year is a KS test of the differences in wage distributions based on these definitions statistically significant at the .05 level.

[39] As with wages, the CVs for annual earnings increase over time (i.e., from Year 1 to Year 10) for all sectors but much less so for teachers (22 to 45) than for non-teachers in education jobs (64 to 87) or people employed outside of education (77 to 92).

credentialing 52% of the average cohort of teacher candidates are in teaching positions (compared to 41% in the first year after credentialing) and in the first 5 years 69% of candidates enter the Washington State teacher labor market at least once.[40]

Figure 6 shows the distribution of the year-to-year *differential* in annual wages for those who transitioned into the teacher labor market (solid line) and those who left the teacher labor market (dotted line), by sector.[41] As is readily apparent, Panel A shows that, on average, teacher candidates who moved into teaching positions from other education-related jobs saw large jumps in their hourly wage (about $8 per hour) and those who moved out of teaching positions but stayed in the field of education saw large drops in their hourly wage (about $5 per hour). Such wage changes were even larger for those who moved into or out of teaching positions from or to non-education sectors (see Panel B). Specifically, those who moved from other sectors into teaching saw an increase in wage of about $12 per hour, whereas those who moved from teaching into other sectors tended to see their wages fall by about $11 per hour.[42] We are unaware of any research that documents differentials in pay for people moving *into* the teaching profession, but our findings on movement out of teaching are broadly consistent with Chingos and West (2012) and Feng (2014), who examine the pay changes for teachers who leave their teaching positions.[43]

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[40] About 10% of those who were initially observed as teachers left the teacher workforce the following year; nearly 44% of initial teachers left (at least once) within the first 5 years. On average, smaller percentages of people transitioned into (2%) and out of (8%) teaching between 5 and 10 years after graduation.

[41] Year-to-year differentials in *earnings*, which reflect the same general patterns, are shown in Appendix Figure 7A.

[42] KS tests comparing the differences in distributions of "To Teaching" and "From Teaching" within and across sectors are statistically significant ($p < .001$).

[43] For example, Chingos and West found that, on average, teachers saw earning decreases of about $13,000 when they left the public school system, with K–8 teachers experiencing a larger drop ($14,600) than high school teachers ($11,800). We find that teachers who made similar transitions lost about $17,000, on average, with K–8 teachers experiencing a larger loss ($19,500) than high school teachers ($16,500). However, while Chingos and West also found that teachers who left teaching for other non-teaching positions within public schools earned slightly *more* (about $2,000), we find such transitions yielded *lower* earnings (by roughly $14,000). This is likely because their sample includes teachers who moved to higher paying administrative positions later in their careers, while our

We also assess the degree to which the findings differ across the years in which individuals transitioned between sectors; for instance, many of those who moved into teaching early in a career may simply have been in low-wage jobs while waiting for a teaching slot to open up, and this type of career move seems less likely for those later in their careers. We test this by comparing the distributions of wage changes for teacher candidates who moved into and out of teaching positions in Years 1–5 after graduation and the distributions for those who made similar transitions in Years 6–10. We find that people who moved out of teaching earlier (Years 1–5) had larger wage drops than those who made a similar transition during the following 5 years (Years 6–10), by nearly $2.[44] The differences in wage changes are smaller for those who moved into teaching regardless of whether this transition took place in earlier or later years. People who moved into teaching earlier had slightly larger wage increases than those who moved into teaching later (larger by about $0.50).[45]

4.5. Heterogeneity by Employment Category

A final concern with these results is that the non-teaching categories represent a large range of different employment categories, from "Health Care" to "Public Administration," and pooling across these categories in the "Other" category in previous figures may not be an accurate reflection of differential earnings and wages outside of education. We therefore divide these categories into finer grained categories in two ways. First, using data on all certificated public school employees from the S-275, we distinguish between certificated non-teachers

sample includes only early-career teachers, very few of whom (less than 1%) entered such positions during our observation window.

[44] Wages fell by $6.50 for people who left teaching in the first 5 years and by $4.80 for those who left during the following 5 years. A KS test reveals statistically significant differences ($p < .001$) in the distributions of people who transitioned out of teaching in earlier versus later years.

[45] A KS test of the differences between the distributions of people moving into teaching in early versus later years is statistically significant at the .05 level.

working as public school administrators, as public school aides, and as other public school certificated employees (e.g., teacher coaches). All other candidates employed by public schools are placed into a "Public School Non-Certificated Employee/Late Hire" category; unfortunately, we cannot distinguish between candidates who are working in non-certificated positions (e.g., substitute teachers) and candidates who were hired into certificated positions after the state's October 1 data collection deadline (e.g., late teacher hires). All candidates employed in an "Educational Services" position according to the UI data but not employed by a public school (e.g., a private school teacher) are placed into the "Other Educational Services" category. Finally, using NAICS codes in the UI data, we place all candidates in non-education-service positions into the categories of "Health Care," "Professional Services," "Public Administration," "Other Services," and "Other."[46]

We present separate wage histograms for these employment categories by years after student teaching (1, 3, 5, or 10 years) in **Figure 7**. The overarching conclusion is that there is little variability in average wages across the non-education employment categories— in fact, the average wages across all non-public-school categories are within $8 per hour even 10 years after student teaching—and the wages in these categories are consistently lower than in teaching. A notable exception for non-teaching categories is that, not surprisingly, teachers who move into administrative positions 5 or 10 years after student teaching have the highest average wages across all of these categories. Otherwise, this heterogeneity analysis suggests that the broad

[46] "Health Care" and "Public Administration" represent one-to-one mappings to the corresponding NAICS employment sectors. "Professional Services" includes Administrative and Support and Waste Management and Remediation Services; Finance and Insurance; Information; Management of Companies and Enterprises; and Real Estate and Rental and Leasing. "Other Services" includes Accommodation and Food Services; Arts, Entertainment, and Recreation; and Other Services (except Public Administration). All other sectors—Agriculture, Forestry, Fishing, and Hunting; Construction; Manufacturing; Mining, Quarrying, and Oil and Gas Extraction; Professional, Scientific, and Technical Services; Retail Trade; Transportation and Warehousing; Utilities; and Wholesale Trade—are included in "Other."

categories used previously are a reasonable representation of the average wages and earnings even within these categories.

5. Discussion and Conclusions

This analysis was motivated by a simple question: When individuals who train to be teachers and receive a teaching credential do not ultimately become teachers, is it because they are being lured away from teaching by higher salaries in other professions? The answer to this narrow question—at least during this time period and in this state (Washington)—is no. The teacher candidates in this sample received considerably higher salaries in public teaching positions than candidates in non-teaching positions as well as higher salaries than they themselves received before transitioning into public teaching positions or after transitioning out of such positions.

The broader implications of this analysis are more complicated, both because our findings are based solely on the labor market in Washington State[47] and because we cannot consider the opportunity costs of becoming a teacher for individuals who do not get through the teacher preparation pipeline all the way to the point of being credentialed. Moreover, there is important recent evidence of declines in teacher education program enrollment and graduation (e.g., Fuller & Pendola, 2020), perhaps driven by declining interest in teaching as a profession (Bartanen & Kwok, 2022). These caveats suggest we need more recent evidence from a broad range of locations about the factors influencing the decisions of individuals to pursue a teaching

[47] Note that teaching in Washington became relatively more financially desirable in the decade that comprises most of our data. In particular, from 2010 to 2020, average teacher pay in Washington State increased by nearly 16%, which is the largest increase in the country (Tate, 2020); in fact, by 2020 Washington State teachers' average salaries ($73,000) were 9.6% higher than the average salaries for all other occupations ($67,000) (Wheelwright, 2021). Teacher preparation completions in Washington have also increased slightly over this time period (from 2739 in 2010-11 to 2994 in 2018-19), which is different than the substantial decreases seen nationally (from 217,506 in 2010-11 to 150,200 in 2018-19; Title II, 2022).

career, especially evidence that pertains to prospective teachers earlier in the pipeline (before individuals are credentialed to teach).

Caveats aside, we believe that this analysis provides some important and novel evidence that, at least among individuals trained and credentialed to be teachers, teacher salaries do not appear to be the driving impediment to pursuing a teaching career. Many candidates who do not enter public school teaching immediately are taking relatively low wage positions in education (e.g., as substitute teachers) that may lead to a public school teaching position in subsequent years; in other words, they are likely considering the "option value" of these types of positions in addition to their short-term compensation. But the story is not entirely about option value either, as teachers in our sample who leave for non-teaching positions also earn relatively less after this transition, which could reflect job mismatches or departures from the teacher workforce for reasons other than the existence of higher paying jobs in other fields.

The findings about delayed entry (or non-entry) into the teaching workforce are also important for assessing supply and demand conditions in teaching and making projections. In particular, prior projections of teacher supply have required assumptions about the number of teacher candidates who are likely to enter the public school workforce (e.g., Levin et al., 2015; Sutcher et al., 2016; Wan et al., 2019). Estimates of this number have been based on historical counts of new teacher workforce entrants, but this approach assumes that these historical counts are a reflection of teacher candidates' preferences and ignores the number of slots available for prospective teachers (Goldhaber & Theobald, 2016). In other words, even if there were substantially more candidates than slots available in a given year—and thus the bench of potential teachers was a lot longer—this approach produces the exact same estimate of teacher supply as in a scenario where every aspiring teacher receives a teaching job.

This analysis supports prior work (e.g., Goldhaber et al., 2022) that has shown that there is a substantial bench of potential teachers available to move into public school teaching positions when a job opens in the years after student teaching. In other words, while we cannot say how many of the teacher candidates not observed as teachers wished to have a public school teaching position, our findings on earning changes are consistent with the notion that a large proportion of those candidates who are not immediately employed as teachers still want to teach, implying a longer teacher bench (in the short run) than is typically projected. But the broader point to be taken from our work is that there is a need to frame issues at the front end of the teacher pipeline in terms of *both* supply and demand factors rather than framing trends solely around the decisions and preferences of teacher candidates themselves.

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Tables and Figures

Table 1. Sample Sizes by Year and Sector

Years since student teaching	Any teaching	In ed services	Other	Not in UI data	*N*
1	5,789 40.8%	5,148 36.3%	1,805 12.7%	1,433 10.1%	14,175
2	7,339 51.8%	3,569 25.2%	1,480 10.4%	1,788 12.6%	14,176
3	7,811 55.1%	2,872 20.3%	1,359 9.6%	2,134 15.1%	14,176
4	7,896 55.7%	2,405 17.0%	1,337 9.4%	2,538 17.9%	14,176
5	6,915 54.4%	2,031 16.0%	1,249 9.8%	2,506 19.7%	12,701
6	6,010 52.5%	1,807 15.8%	1,142 10.0%	2,488 21.7%	11,447
7	5,120 50.3%	1,583 15.6%	1,039 10.2%	2,437 23.9%	10,179
8	4,240 48.0%	1,372 15.5%	920 10.4%	2,303 26.1%	8,835
9	3,382 46.5%	1,145 15.7%	751 10.3%	2,001 27.5%	7,279
10	2,566 44.1%	989 17.0%	616 10.6%	1,644 28.3%	5,815

Figure 1. First-Year Earning Sources by Sector

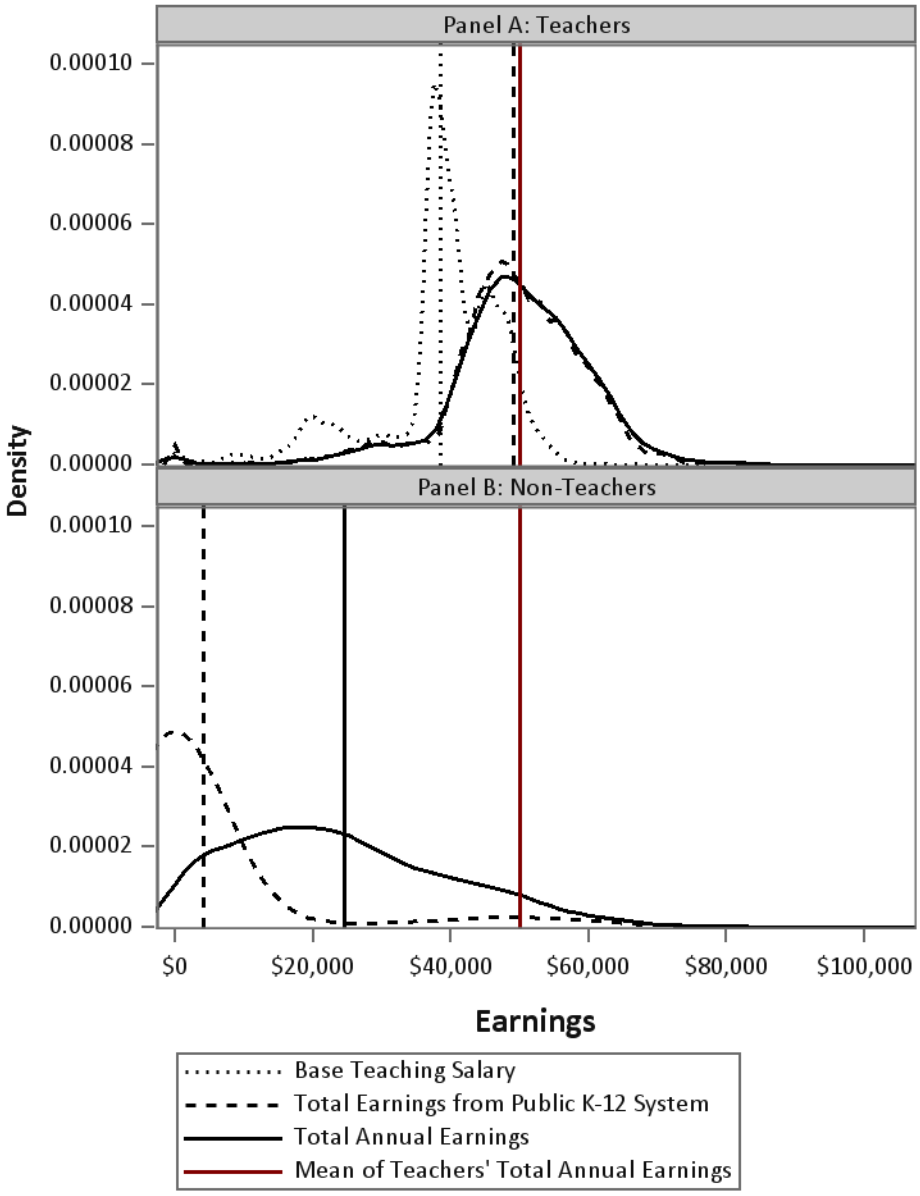


Figure 2. First-Year Non-Education Hours Worked in Secondary Jobs by Stable Employees by Sector and Quarter

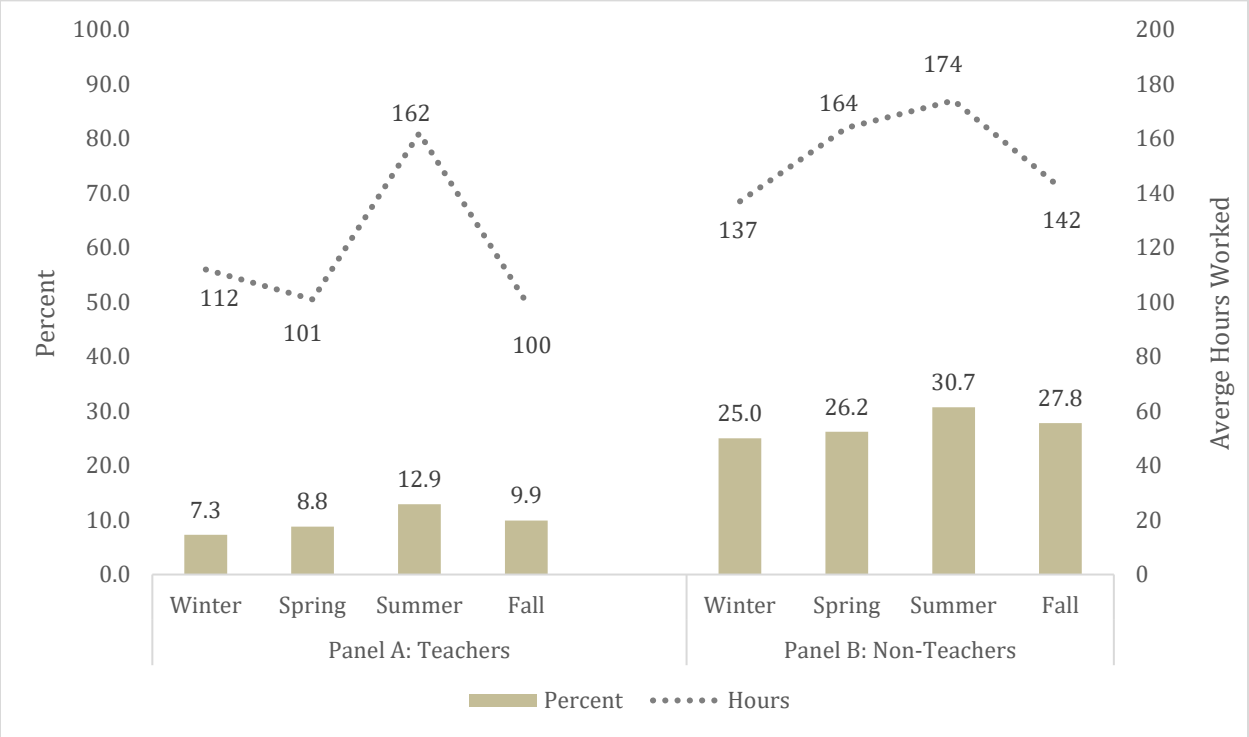


Figure 3. First-Year Hours in Primary Job by Sector

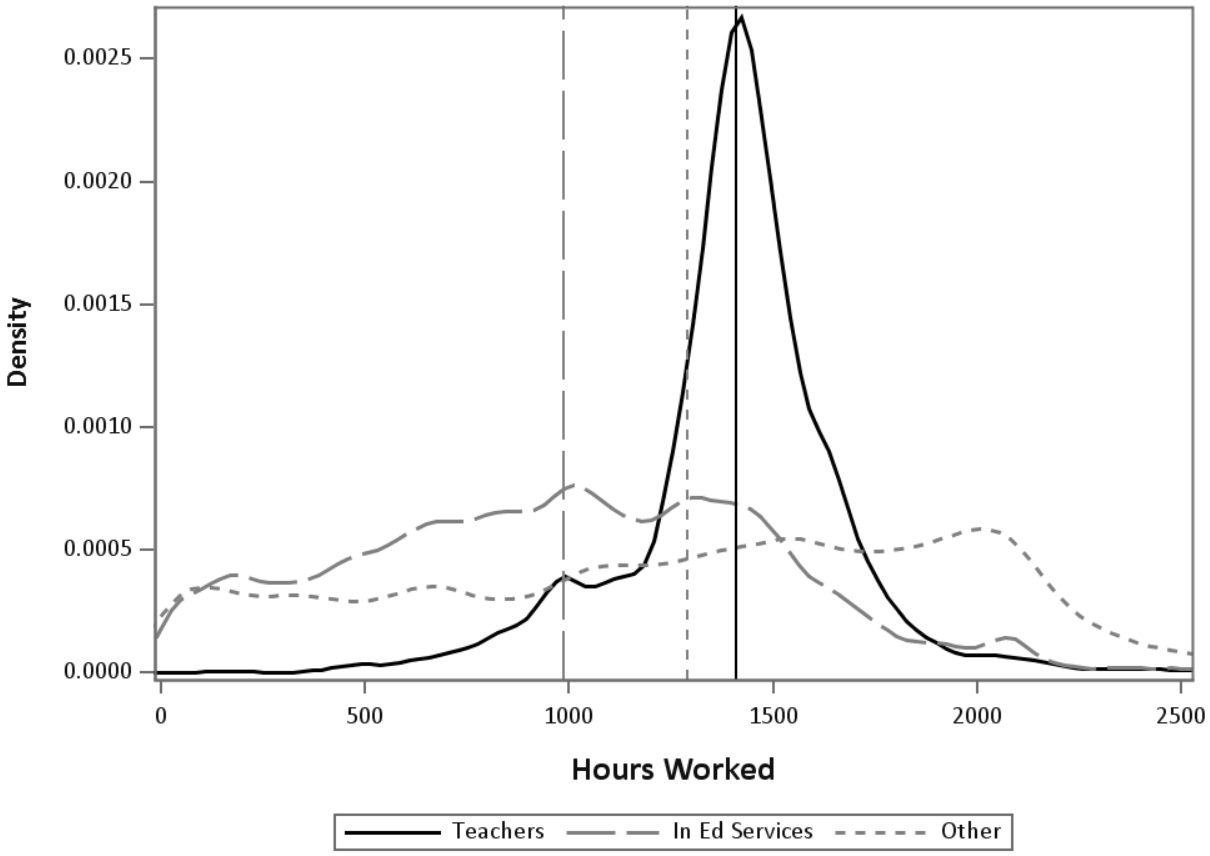


Figure 4. First-Year Wages by Sector

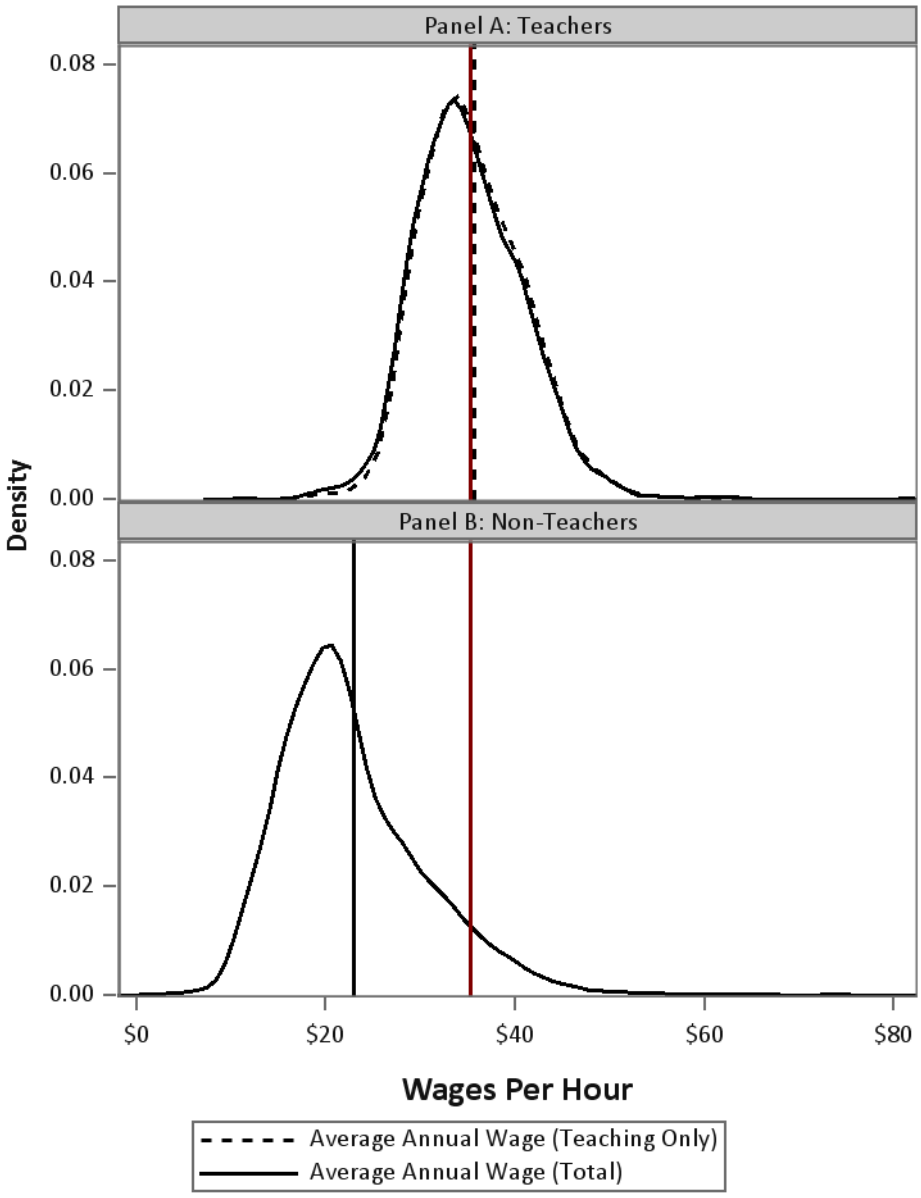


Figure 5. Wages Over Time

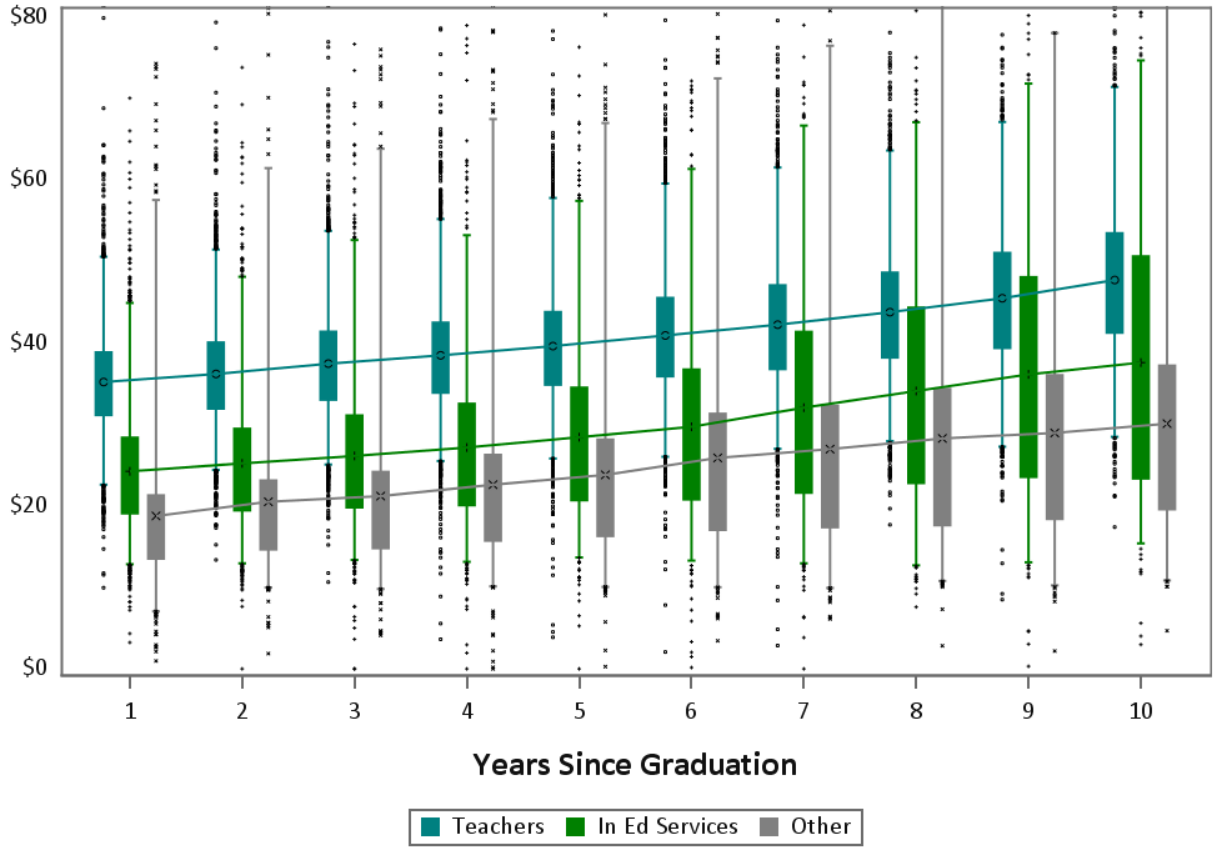


Figure 6. Year-to-Year Differential in Wages by Employment Transition Type

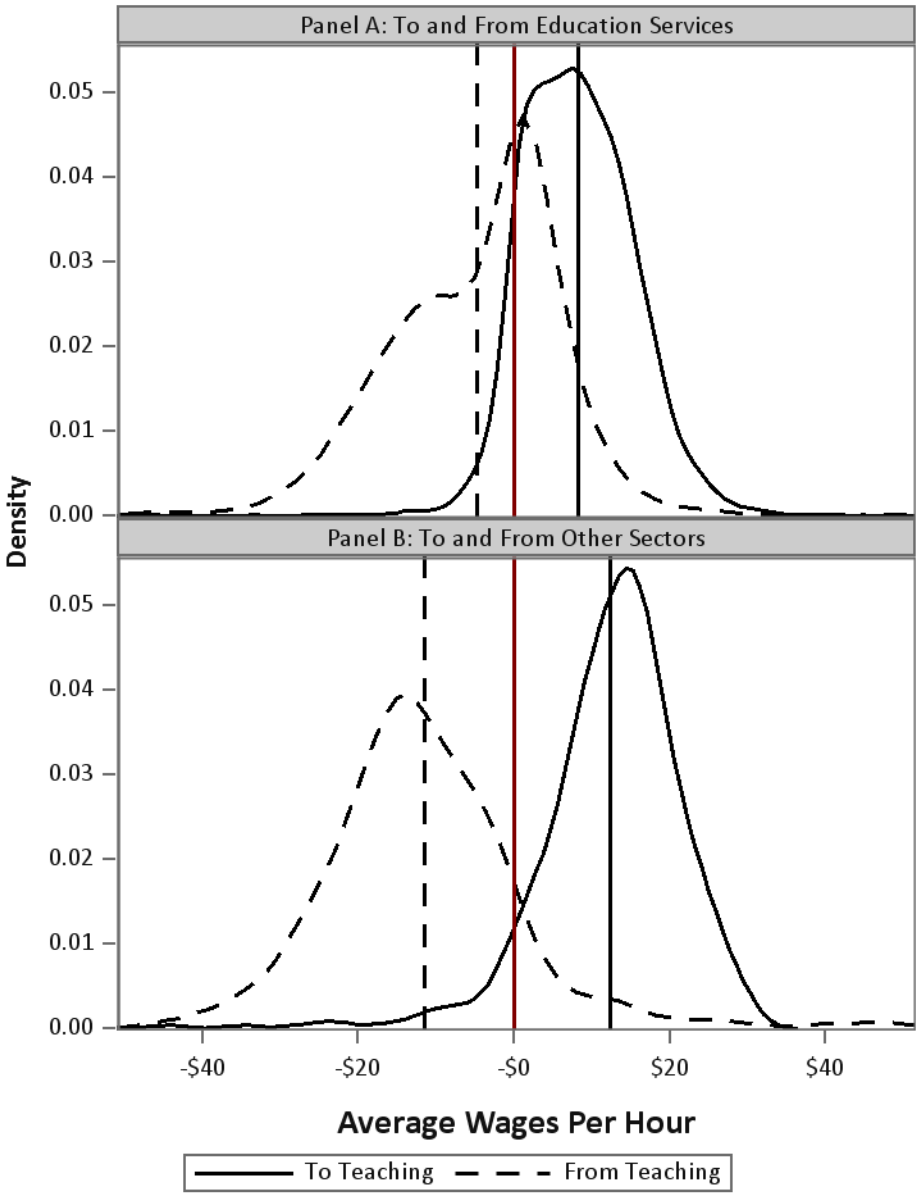
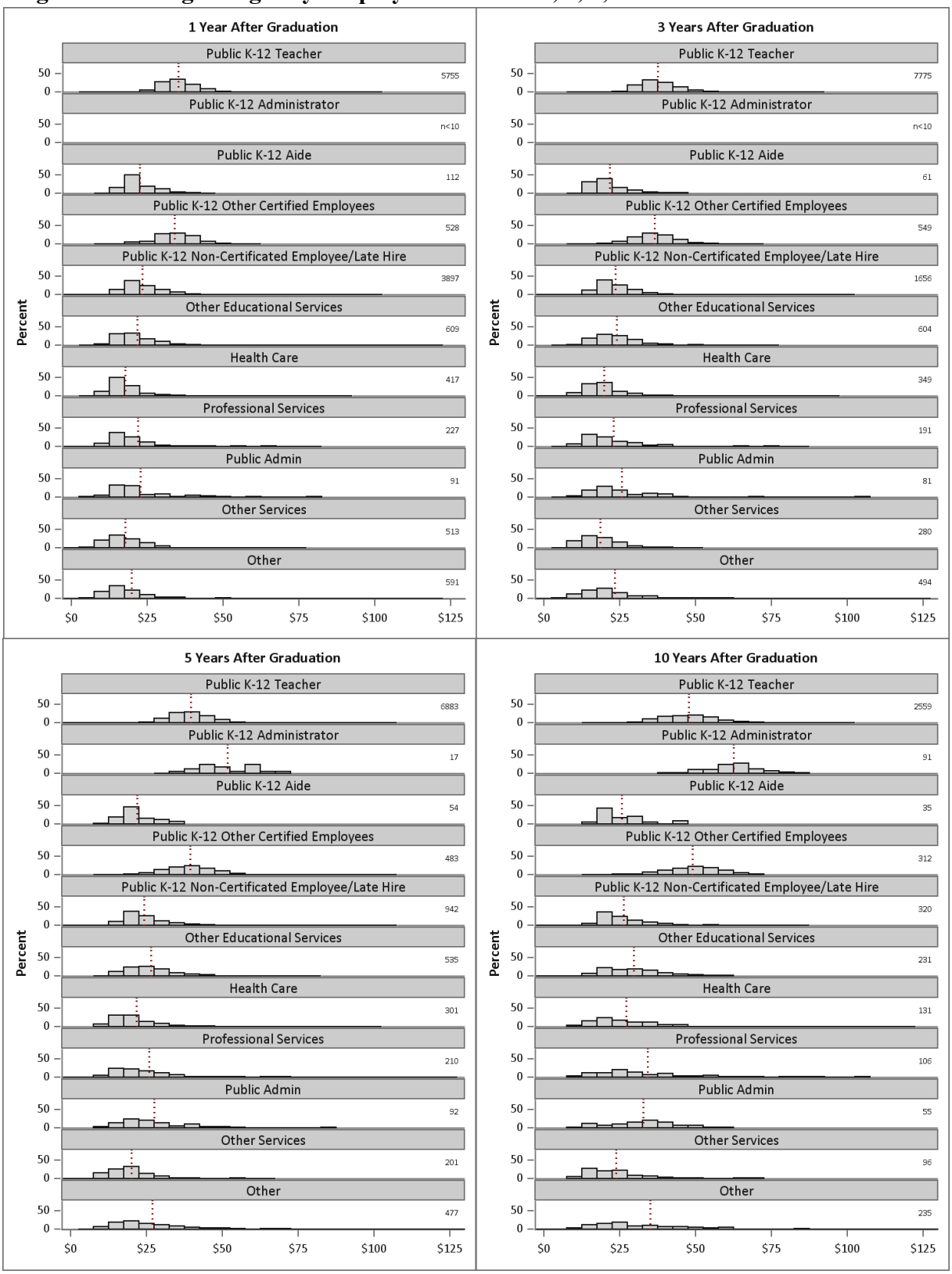


Figure 7. Average Wages by Employment Sector 1, 3, 5, and 10 Years After Graduation



APPENDIX

Figure 1a. First-Year Teachers' Earnings by Sector

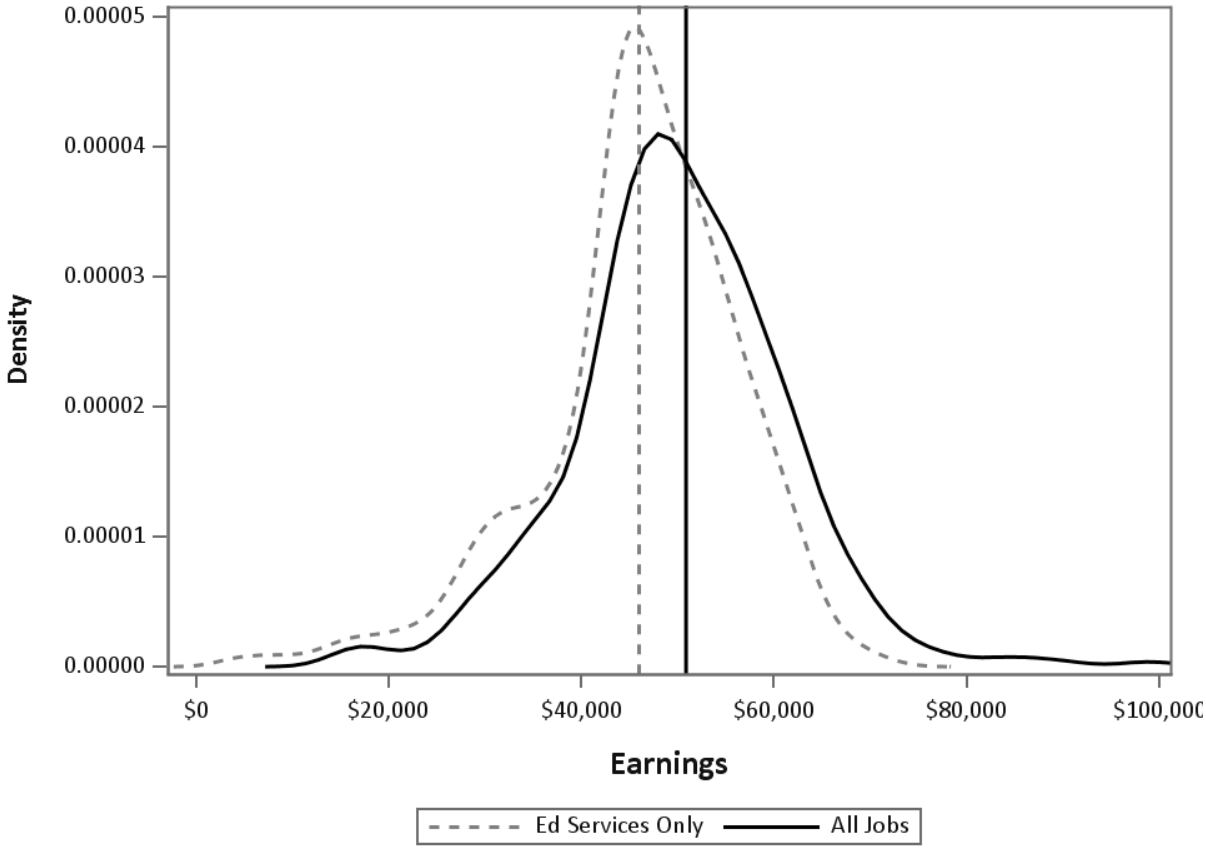


Figure 2a. First-Year Non-Education Hours Worked in Secondary Jobs by All Employees by Sector and Quarter

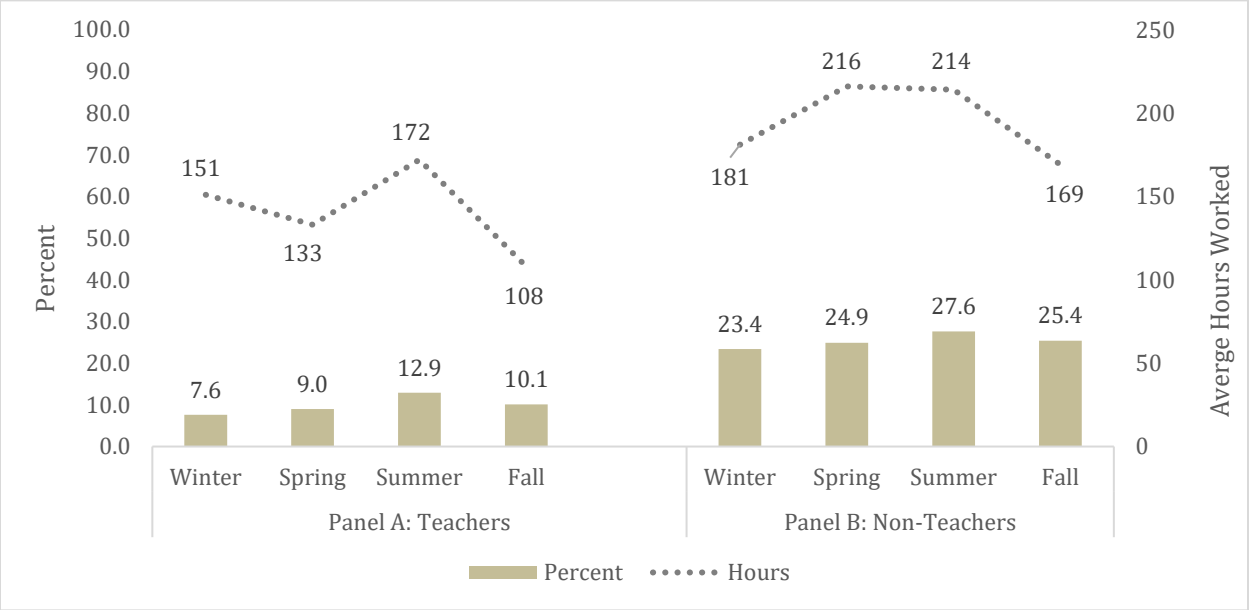


Figure 3a. Annual Rates of Multiple Jobholding Over First 10 Years by Sector

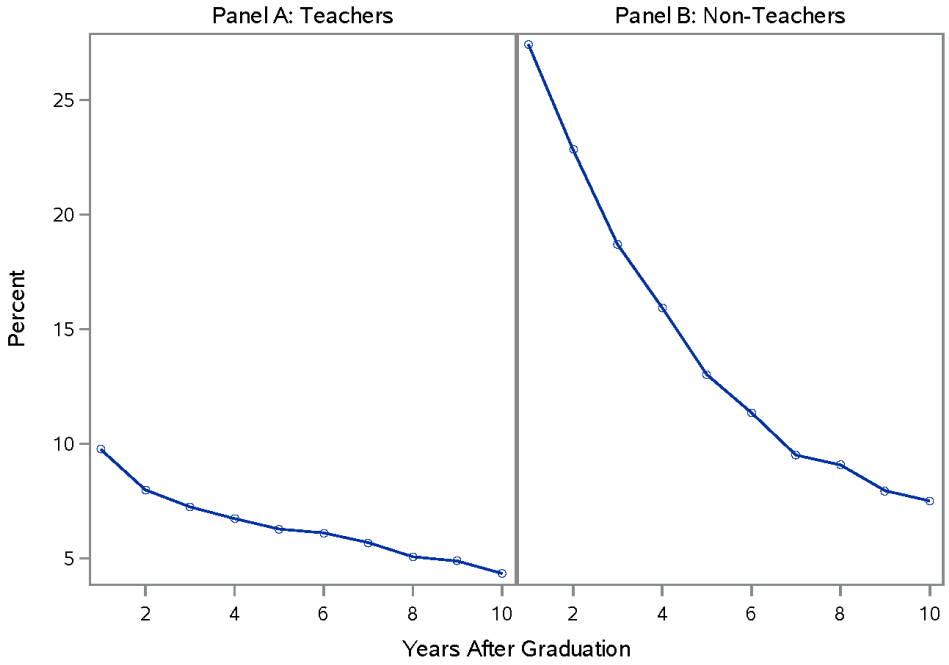


Figure 4a. First-Year Teachers' Earnings Outside of Teaching by Quarter

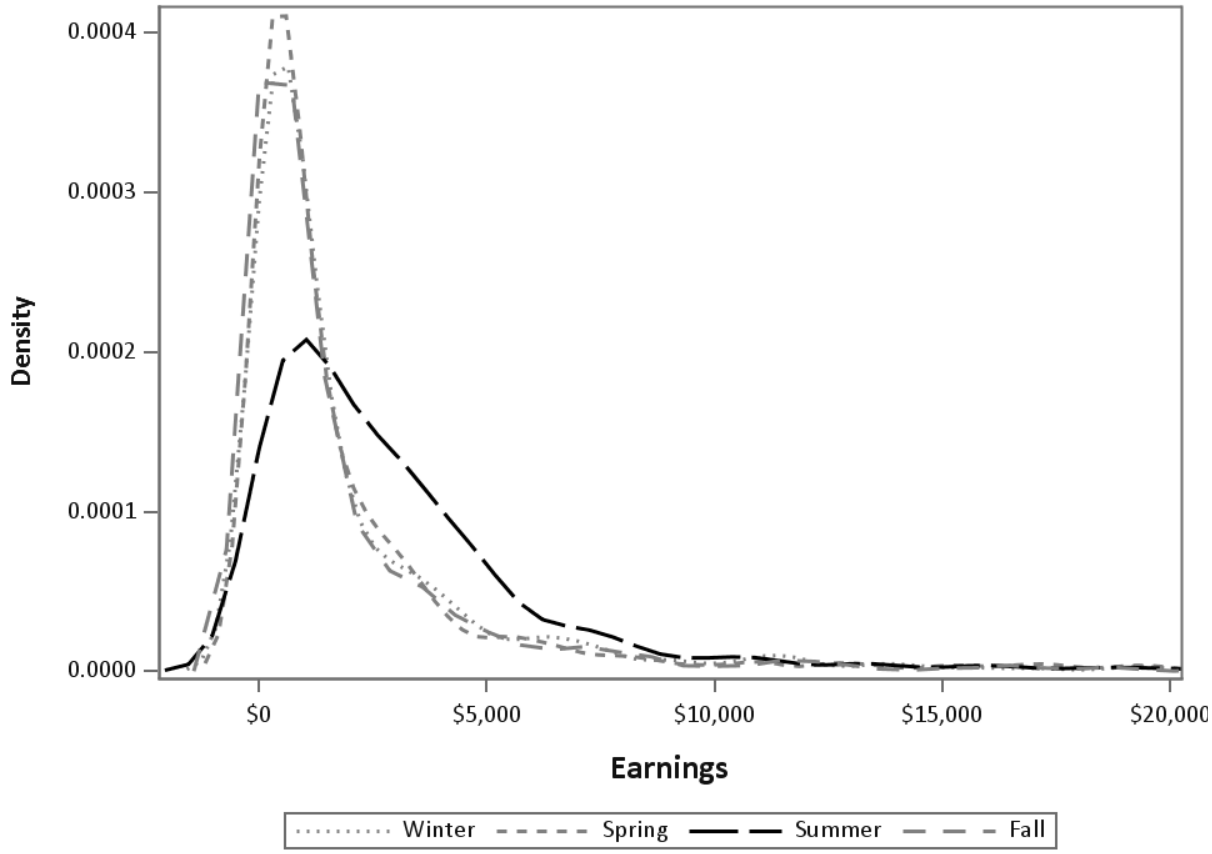


Figure 5a. Wages Over Time by Sector (Including Candidates Never Employed in Education Services)

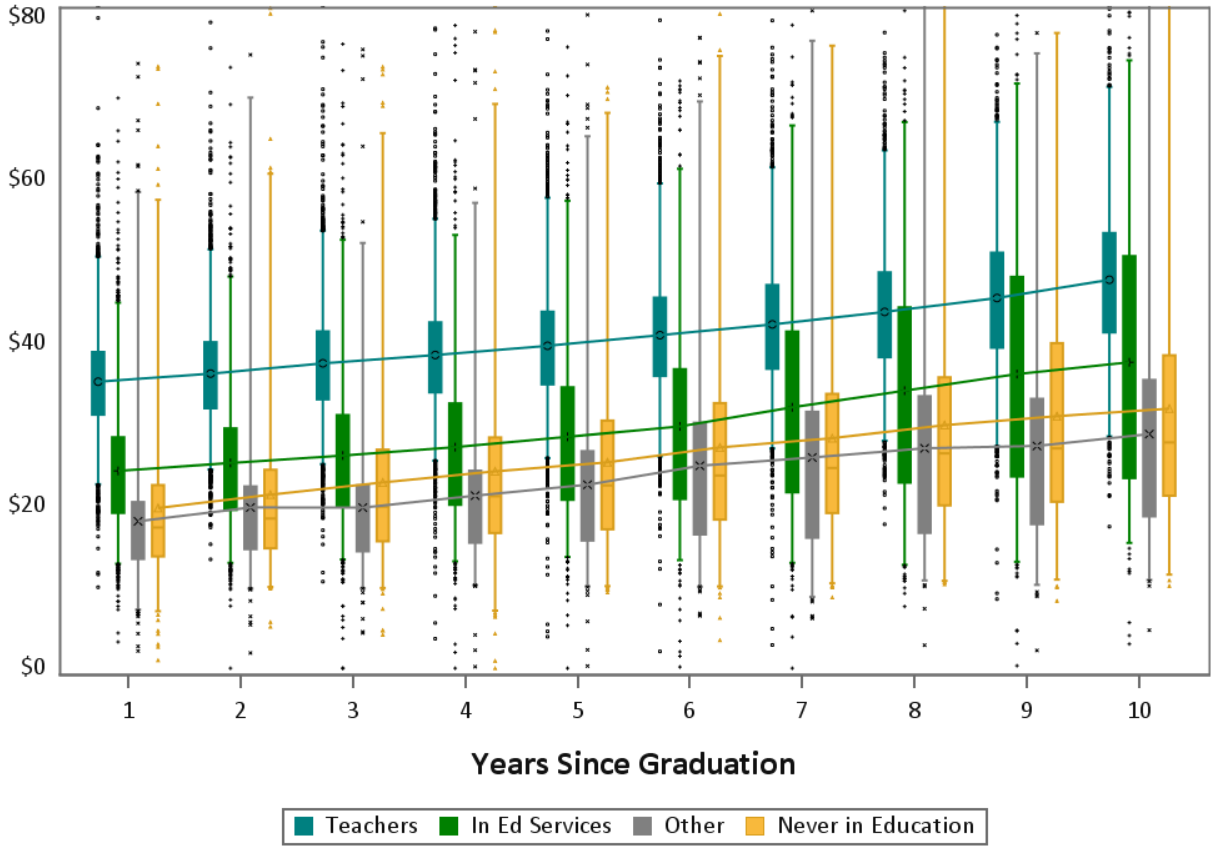


Figure 6a. Earnings Over Time

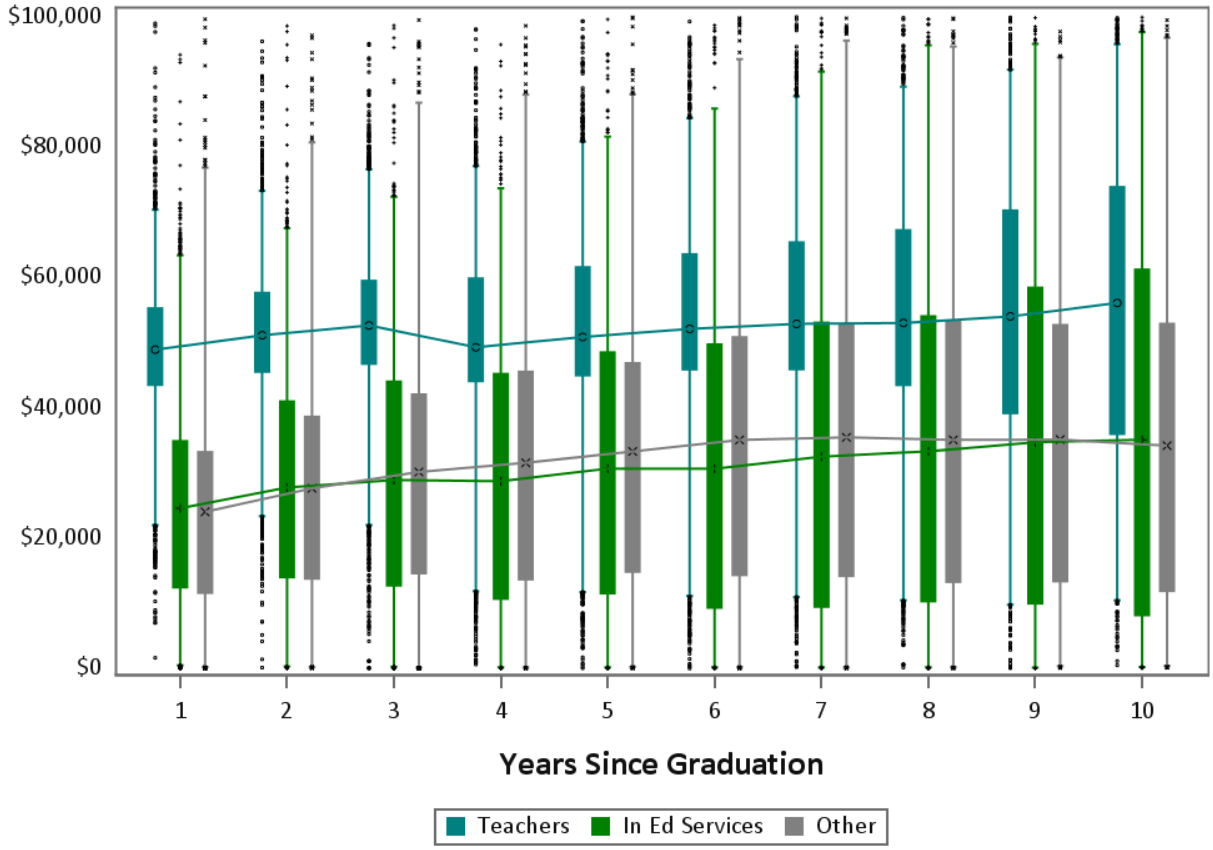


Figure 7a. Year-to-Year Differential in Earnings by Employment Transition Type