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Teacher Pension Choice: Surveying the Landscape in Washington State

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ABSTRACT: In this descriptive paper we detail the structure of two Washington State teacher retirement plans: a traditional defined benefit plan and a hybrid defined benefit-defined contribution plan. We provide preliminary evidence on how retirement plan structures may relate to the choices that teachers make. Our analysis of the financial incentives offered to Washington State teachers under the two different plans reveals several patterns that may influence teacher behavior. Teachers experience large gains in their pension wealth by crossing key age and experience thresholds. The relative magnitude of expected pension wealth differs sharply between the plans depending on when a teacher anticipates exiting the position, and the magnitude of anticipated returns to investment. We observe teacher choices between the traditional defined benefit plan and the hybrid plan during two time periods: 1996-1997 and 2008–2010. In 1996–1997 teachers were offered a financial inducement to switch into the newly created hybrid plan and defaulted into staying in the traditional plan if no action was taken. Teachers hired during 2008–2010 defaulted into the hybrid plan if no action was taken. Most of the teachers who were given a choice opted for the hybrid plan. This preference for the hybrid plan is more pronounced among the 1996–1997 cohort, who received a financial incentive in the form of a transfer payment for switching. The notable exception is among teachers who were over 55, and or teachers with relatively high experience levels, who were more likely to choose the traditional defined benefit plan.

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I. Introduction

Numerous studies show that student academic success depends in large part on access to high quality teachers.¹ Efforts to improve student performance should, given this fact, consider policies designed to promote the staffing of effective teachers. Compensation practices offer one potentially important avenue for helping districts and schools to attract, motivate, and retain a highly talented workforce. A number of studies have examined how salary and working conditions might influence teachers' career paths (e.g., Boyd et al., Forthcoming; Clotfelter et al., 2008; Goldhaber et al., 2010; Scafidi et al., 2007), but researchers have only recently begun to consider how the structure of teacher retirement incentives influences labor market behavior. A significant proportion of teacher compensation is in pensions,² and researchers and policy makers need a better understanding of whether and how pensions influence the composition of the workforce.

Questions related to the design and impact of teacher retirement systems are particularly salient today. There is, for instance, growing concern that states have failed to adequately fund and manage their employee pension systems, a problem exacerbated by the recent financial downturn. Current estimates of state pension funding show a shortfall that totals \$1 trillion to \$2 trillion nationally (Barro and Buck, 2010; Bullock, 2010; Novy-Marx and Rauh, 2011; Pew Center on the States, 2010). Recent work by Fitzpatrick (2011) suggests that teachers would prefer less of their total compensation be deferred in the form of future pension payments, pointing towards opportunities to improve compensation structures for both education systems and teachers. As states look to modify and possibly redesign their teacher pension systems, it is important to understand how pensions might influence teacher labor market behavior, and thus, the quality of the teacher workforce.

Economic theory suggests several ways pensions can influence workforce composition through the incentives they create for mobility and retirement timing. Substantial evidence from both private and public sector labor market research suggests that individuals do, in fact, respond to these incentives, which affect where people decide to work, how mobile they are, and when they decide to retire (e.g., Asch et al., 2005; Dorsey, 1995; Even and Macpherson, 1996; Friedberg and Webb, 2005; Gustman, 1994; Ippolito, 2001). For instance, pensions may include separation incentives that encourage retirement within a particular age range (Chan and Stevens, 2004; Costrell and Podgursky, 2007; Furgeson et al., 2006). They can also encourage geographic commitments if a worker must forfeit retirement contributions or benefits when moving to a new location (Koedel et al., 2011).

Pension incentives may also induce certain types of individuals to self-select into a workforce (Salop and Salop, 1976; Ippolito, 2001, 2002). The incentives described above will be more or less attractive to a potential worker depending on whether she plans to change location, change careers, or retire at a certain age or experience level. Self-selection into an occupation

¹ See, for example, Hanushek, 1992; Sanders and Rivers, 1996; Wright et al., 1997; Sanders and Horn, 1998; Rockoff, 2004; Rivkin et al., 2005; Aaronson et al., 2007.

² According to an analysis by Costrell and Podgursky (2009), employer contributions to teacher retirement benefits make up to 14.6 percent of teacher earnings.

may also depend on personal characteristics such as tolerance for risk, confidence about managing one's own assets, and desire for personal control over financial assets (Croson and Gneezy, 2009; Dohmen and Falk, 2011).

Washington State's Teacher Retirement System (TRS) provides a useful case study of teacher preferences for different pension structures. Unlike most other states, Washington has, over certain periods, allowed teachers to choose between two different types of retirement plans: a traditional defined benefit plan and a hybrid defined benefit-defined contribution plan.³ These periods of choice allow us to study how teachers respond to pension plan change, how they value different pension characteristics, and how pension structures influence their behavior. TRS is also an example of a pension system that is on much better financial footing than in most other states.⁴

In this paper we examine the retirement options available to Washington State teachers between the 1996 and 2010 school years. Similar to other teacher pension research,⁵ we analyze the structure of pension wealth accruals for each plan over time. Then, drawing on data linking teacher pension and personnel records, and district and school level student demographic and achievement data, we provide a descriptive account of how the features of each pension plan relate to teacher retirement and mobility behavior. In cases where teachers were able to choose between plans, we show how teacher, school, and district characteristics are distributed across the two retirement plans. The goal of this paper is primarily descriptive and exploratory—to detail the structure of Washington's TRS plans and provide preliminary evidence on how retirement plan structures may relate to the choices that teachers make. The paper concludes by outlining several future research directions indicated by these preliminary results.

Our analysis of the financial incentives offered to Washington State teachers under two different retirement plans reveals several patterns that may influence teacher behavior. Teachers experience large gains in their pension wealth by crossing key age and experience thresholds. The relative magnitude of expected pension wealth differs sharply between the plans depending on when a teacher anticipates exiting the position and on anticipated returns to investment. We observe teacher choices between the traditional defined benefit plan and the hybrid plan during two time periods: 1996–1997 and 2008–2010. In 1996–1997 teachers were offered a financial inducement in the form of a transfer payment to switch into the newly created hybrid plan and defaulted into staying in the traditional plan if no action was taken. Teachers hired during 2008–2010 defaulted into the hybrid plan if no action was taken. Most of the teachers in these two time periods opted for the hybrid plan, but this preference for the hybrid plan is more pronounced

³Other states with hybrid plans with DC options include Indiana, Oregon, Florida, Ohio, South Carolina, Alaska, and West Virginia (Hansen, 2010).

⁴ Of Washington's three pension plans for teachers, the original plan (TRS1) is the only underfunded plan, at 84 percent (shortfall of \$1.4 billion). The other two plans open to current teachers, TRS2 and TRS3, are amply funded (at 116 percent as of state fiscal year 2010). New evidence, however, suggests that the plan is less financially sound after accounting for post-retirement benefits such as health care (Pew Center on the States Report, 2010). Furthermore, some economists (e.g. Barro and Buck, 2010 and Novy-Marx and Rauh, 2011) argue that the long term average investment returns assumed by state actuaries (usually around 8 percent) are overly optimistic. Legislation adopted in 2012 in Washington State will lower its assumed discount rate from 8 percent to 7.7 percent (Senate Bill 6378, Laws of 2012).

⁵ For example, Podgursky and Costrell (2007) and Friedberg and Turner (2011).

among the 1996–1997 cohort. This result is consistent among most sub-groups, including most categories defined by gender, race, age, experience, and school characteristics. The notable exception is teachers who were over 55 and teachers with relatively high experience levels, who were more likely to choose the traditional defined benefit plan.

II. Background on Pension Structures

Pensions are a type of deferred compensation designed to help employees replace employment income after retirement. This section describes how pensions work, with a focus on how features that may influence workforce composition differ between defined benefit and defined contribution pension plans. Section III describes the Washington State TRS plans in particular.

Two Types of Pensions: Defined Benefit and Defined Contribution

Pension plans can be classified into two general categories: defined benefit (DB) plans and defined contribution (DC) plans. DC plans predominated in both the public and private sector into the 1980s. During the 1980s and 1990s there was a significant shift in the private sector toward DC-type plans; by 2003 less than 10 percent of wage and salary workers with pension coverage were covered by pure DB plans, compared to over 55 percent in 1981 (Buessing and Soto, 2006). This is also true for most federal employees, who have been enrolled into a DC pension plan since Congress passed the Federal Employee's Retirement System Act of 1986, which created the Thrift Savings Plan. Public school teachers, by contrast, remain primarily enrolled in DB plans: currently, 83 percent of the pension plans covering public educators are pure DB plans. Less than 4 percent of plans are pure DC plans.⁶

The distinguishing features of a DB plan are its predictability and its method for allocating post-retirement wealth over time. It provides a guaranteed stream of annual income (much like an annuity) from the time of an employee's retirement until the end of life. Typically, the level of retirement income is based on a formula accounting for years of service and peak salary levels. Most public sector pensions provide cost-of-living adjustments (COLAs) to the annual retirement benefit as well as health benefits (Hansen, 2010). Each system's rules dictate how long an employee must work to become eligible for retirement benefits and when an employee is eligible to begin drawing annual payments. A DB pension is funded by contributions from the employer and in most public sector systems, the employee as well (Hansen, 2010). However, retirement benefits are not generally tied to the size of these contributions.

Under a DC plan, the employer establishes an individual retirement account for an employee who is required to contribute some minimum percentage of income to the account (for example, 5 percent). In many cases, the employer will also contribute to the account on the employee's behalf (often based on the employee's contribution rate). Taxes on these accounts are deferred until the employee withdraws funds and federal tax rules determine when an employee

⁶ See the 2010 National Education Association report "Characteristics of Large Public Education Pension Plans" for more information about pension plan characteristics in each state.

is eligible to begin withdrawing funds.⁷ Common DC plans in the United States include the Individual Retirement Account (IRA) and 401(k) plans. Two distinguishing features of a DC plan are: 1) the level of retirement savings available to an employee is directly tied to the level of contributions into the account and the investment returns; 2) in contrast to a DB plan's annual payments, the employee decides the rate at which DC funds will be utilized upon retirement.⁸

Under most pension systems, an employee must work a minimum of 5 to 10 years before becoming eligible to benefit from any employer contributions to retirement, at which point the employee becomes vested. Under a DB plan, an employee is not eligible to receive any pension before becoming vested, but may withdraw personal contributions plus interest.⁹ Under a DC plan, an employee does not own any contributions made by the employer until vested, but controls all assets associated with the personal contributions. In short, employer contributions to employee retirement benefits under both types of plans are not portable until an employee becomes vested.¹⁰

Tradeoffs of DB and DC plans for employees

For employees, there are a number of tradeoffs between DB and DC pension structures.¹¹ Whether individuals prefer either pension structure is likely to depend on individual preferences for risk and flexibility (e.g. pension portability). Two primary differences between DB and DC plans are: 1) who is primarily responsible for investment decisions and 2) who bears the risk associated with uncertain rates of return on investments. Under a DB plan, an employee does not make investment decisions that affect the size of the retirement benefit. Indeed, the size of the pension is not determined by any person's investment decisions; it is formulaic. Hence, the important pension-related decisions for a DB employee are when to separate (i.e. leave job) and when to retire (i.e. begin drawing benefits). Under a DC plan, by contrast, employees decide how much to contribute to retirement accounts, where to invest the funds, when to retire, and how to distribute the consumption of funds during retirement (though these decisions are constrained by federal tax rules).¹²

The *overall* risk associated with the rate of return on investments and employee life expectancy is the same under both types of systems. But, under a DB plan, an employee bears no financial risk associated with the size of the benefit, which is known and guaranteed.¹³ If the contribution rate to the DB plan is variable, the employee will face risk associated with

⁷ An employee may withdraw funds from retirement accounts at any time, but face penalties for withdrawing before eligibility for retirement at age 59 $\frac{1}{2}$.

⁸ Should a retiree with a DC pension plan wish to obtain a guaranteed annual income for the duration of retirement, DC account assets could be used to purchase annuities. The size of the annuity would depend on life expectancy at the time of purchase.

⁹ Employee contributions to a DB plan typically earn a fixed annual return set by the employer.

¹⁰ After an employee becomes vested, both DB and DC plans are portable. The employee may move to a different job and maintain the retirement benefits that have been earned. The primary difference is that under a DC plan, the benefits are no longer tied to the former employer.

¹¹ For a more in-depth discussion of the general tradeoffs between DB and DC pension plans see Bodie et al. (1988).

 $^{^{12}}$ Federal tax laws penalize the withdrawal of funds from individual retirement accounts before the age of 59¹/₂ with an additional tax of 10 percent.

¹³ Recent concerns about the underfunding of DB pension plans, the political unpopularity of raising taxes to bolster them, and the financial fragility of many states raises questions about the certainty of DB retirement benefits.

fluctuations in the rate (Koedel et al., 2012).¹⁴ A DC employee chooses a contribution rate and decides to make either low- or high-risk investments, bearing the full financial risk of investment decisions. Furthermore, a DC employee must accommodate the uncertainty associated with longevity, whereas a DB employee can count on pension payments for the duration of life. An employee's preferences for DB and DC plans are likely to depend in part on how risk averse the employee is and whether or not the employee expects to live for a long time after retiring.

A new employee's preference for a DB or DC plan may depend on the expected tenure with the employer and desired retirement timing. For both types of plans, vesting rules penalize employees who leave after a short duration by withholding employer contributions. An employee who expects to stay long enough to become vested, but not for the very long term, may prefer a DC plan because DB plans tend to be backloaded.¹⁵ A DC plan may also be more attractive to an employee who desires professional mobility because after vesting, retirement assets are no longer tied to the employer, making them readily portable. Retirement timing under a DB plan is largely dictated by what age and/or experience level an employee becomes eligible to begin drawing benefits because there is a large opportunity cost to delaying retirement: an employee saves unspent retirement funds and the opportunity cost of delaying retirement is limited to foregone leisure time. Finally, employee preferences about making investment decisions will also influence which type of retirement system is seen as more desirable. Employees who garner some satisfaction from making investment choices would, all else equal, tend to favor DC over DB systems.

The structure of pension incentives has large financial consequences for individuals. Though pensions often do not garner the same level of attention as other forms of compensation such as salary and health benefits, the multiple dimensions of pension incentives including wealth, risk, and choice can each influence not only the behavior of current employees, but potential employees as well. An important question facing state policy makers is how teacher preferences towards the tradeoffs described above may affect the composition of the workforce. What types of individuals might consider teaching if they believed their wealth was more portable or more stable? Once on the job, are DB and DC pension structures equally effective at retaining employees? These questions are examined in the context of the revealed choices of Washington State teachers in Section VIII.

III. Washington State Teacher Retirement System

Three Pension Plans

Municipalities in the United States began offering teachers pensions in the late 1800s. The motivation was multifaceted: to make up for low salaries, particularly in rural areas, and to re-shape the composition of the workforce, in part by encouraging older teachers—many of

¹⁴ In Washington, the employee contribution rate is capped at six percent.

¹⁵ The uneven accrual of benefits, with the awarding of larger accruals as tenure increases, is known as backloading. DB plans tend to be backloaded in order to encourage employee retention, but backloading is not inherent to the DB structure.

whom were perceived to be of declining ability and using out-of-date methods—to leave upon being eligible for retirement benefits (Graebner, 1978).¹⁶

Washington established its Teacher Retirement System (TRS) in 1938.¹⁷ All active teachers are enrolled in one of three plans (TRS1, TRS2, or TRS3). TRS1 and TRS2 are both traditional DB plans and TRS3 is a hybrid plan, with both a DB and a DC component. A teacher's eligibility for enrollment into any of these plans depends on when the teacher was hired. During two time periods (July 1996 – December 1997 and 2008 – present), teachers were able to choose between TRS2 and TRS3. These choice periods allow us to analyze teacher preferences for pension structures and will be discussed in detail in Section V below.¹⁸ Figure 1 shows the distribution of teachers in each pension plan by year. As of 2010, 79 percent of teachers were enrolled in TRS3 and 14 percent in TRS2.



Figure 1. Distribution of TRS Plan Membership, WA Teachers 1996-2010

Here, we describe the key features of the three pension systems. Information about the features and rules associated with each pension plan were obtained from the Washington State Teachers' Retirement System Handbooks, published for each plan by the state Department of Retirement Services. Each of these handbooks had been updated as of 2011, and are available at <u>www.drs.wa.gov</u>.

TRS 1

TRS1 covers teachers who were hired before October 1, 1977. It is a traditional DB plan

¹⁶ For a thorough discussion of teacher pension systems in the United States, see Hansen (2010).

¹⁷ The system is operated by the Washington Department of Retirement Services (DRS).

¹⁸ When TRS3 was created in 1996, teachers enrolled in TRS2 were given an opportunity to switch to TRS3. They were offered transfer payments if they switched between July 1, 1996 and December 31, 1997. As described in **Section VI**, size of the transfer payment increased twice. Since 2008, newly hired teachers can choose between TRS2 and TRS3.

that guarantees teachers a pension payment for life (and optionally for a survivor) based on years of service—called "service credit years," or SCY—and the average of the salary of the two highest consecutive paid fiscal years—called "Average Final Compensation," or AFC. The TRS1 monthly benefit formula is: *Annual Benefit* = 0.02*SCY*AFC.¹⁹

TRS1 teachers become "vested" (entitled to benefits) after five years. They are eligible to *collect* retirement benefits after either 30 years of service, at age 55 with 25 years of service, or at age 60 with at least five years of service. Historically, TRS1 benefits were adjusted after retirement, and no sooner than age 66, by a non-contractual cost of living adjustment (COLA) provided at the State's discretion.²⁰ As with most DB plans, if a teacher leaves employment before retiring, contributions can be withdrawn with interest. However, by withdrawing, any right to a future benefit is forfeited.

<u>TRS 2</u>

Like TRS1, TRS2 is a traditional DB plan that guarantees teachers a pension payment for life. It follows the same basic formula (*Annual Benefit* = 0.02*SCY*AFC) and its vesting requirements are also the same (five years). Unlike TRS1, TRS2 bases a teacher's AFC on the 60 highest-paid consecutive service credit months (versus the two years used in TRS1). A teacher enrolled in TRS2 makes contributions to the pension fund equal to at least 50% of the cost of funding the plan. The teacher bears no investment risk in regard to the size of the retirement benefit as it is tied only to the AFC, separation timing, and retirement timing. However, the size of the contributions made by the teacher to help fund the plan are uncertain. Historically, TRS2 contribution rates have averaged about 4.6%.²¹ To accommodate increases in the cost of living during retirement, TRS2 contractually guarantees a COLA to retirement benefits starting after the first year of retirement, up to a maximum of 3 percent per year.

TRS2 benefit eligibility is less generous than under TRS1. A teacher is vested after five years of service and is eligible to receive retirement benefits at age 65 years or older. An employee with at least 20 years of service and 55 years of age is eligible for early retirement, but with reduced benefits determined by an early retirement factor (ERF). For a teacher with 20–30 SCY, the ERF varies between 35.8 percent (at age 55) and 89.6 percent (at age 64). For a teacher with more than 30 SCY, the ERF varies between 80 percent (at age 55) and 98 percent (at age 61).²² A teacher is eligible for health care coverage under TRS2, but only if retirement is begun immediately after separating.

To provide an example of how TRS2 works, consider a teacher who separates and retires at age 62 with 37 SCY and an AFC of \$55,000. If the teacher retires the same year, the pension will provide 0.02*37*\$55,000*100% = \$40,700 for the duration of the teacher's life. Purchasing an annuity providing the same benefit would cost approximately \$550,000 if purchased through the Washington State Investment Board's Total Allocation Portfolio Annuity.

¹⁹ For example, if a TRS1 teacher separates and retires at 55 with 30 years of experience, having earned an average of \$55,000 during the two highest paid years service, the annual pension benefit would be \$33,000.

²⁰ Since 2011, there has been no COLA given to TRS1 pensioners.

²¹ Historical TRS2 contribution rates: www.drs.wa.gov/employer/EmployerHandbook/pdf/trs2elected.pdf

 $^{^{22}}$ Prior to 2008, the ERF tables were less generous, not reaching 100 percent until age 65. See Table 1 in Appendix C for details.

<u>TRS 3</u>

According to the legislation enabling its implementation, the stated purpose of TRS3 was to create,

"...a new public retirement system that balances flexibility with stability, provides both increased employee control of investments and responsible protection of the public's investment in employee benefits, and encourages the pursuit of public sector careers without preventing employees from transitioning into other public or private sector employment." (House Bill 1206, Laws of 1995)

TRS3 is a hybrid pension plan with both DB and DC components. Participation in both components is mandatory for any teacher enrolled in TRS3, but in all other respects the two components operate independently. Teachers contribute exclusively to the DC component and the employer contributes exclusively to the DB component.

The DB component of TRS3 is very similar to the TRS2 plan, but there are several important differences. The DB retirement benefit is halved (*Annual Benefit* = 0.01*SCY*AFC) and only the employer contributes to the plan. The vesting period is longer (ten versus five years), but early retirement requires fewer SCY (ten versus twenty years). A teacher who has at least twenty SCY and separates early receives an increase to the defined benefit of approximately 3 percent per year, for each year retirement is delayed, until age 65.

The plan's DC component is entirely employee-financed. Each teacher controls how contributions are invested and bears the risk of those decisions. The value of a teacher's DC assets upon retirement, which is determined by contribution levels and investment performance, is uncertain. A teacher enrolled in TRS3 is offered the choice of six different contribution rates that range between 5 percent and 15 percent of salary.²³ Upon retirement, accumulated DC assets are allocated at the teacher's discretion. Assets may not be withdrawn prior to separation, and federal tax laws penalize withdrawals made before age 59 ¹/₂.

To provide an example of how TRS3 works, consider a teacher who separates at age 55 with 30 SCY and an AFC of \$55,000. If the teacher retires the same year, the DB component of the pension will provide 0.01*30*\$55,000*80% = \$13,200. If the teacher delays receiving benefits, benefits will be increased by approximately 3 percent for each year of delay, in addition to eligibility for a higher ERF. If retirement is delayed until age 62, the defined benefit would be equal to 0.01*30*\$67,643*100% = \$20,293. The value of the DC pension is uncertain, but let's assume a contribution rate of 5 percent and a standard pay schedule for a teacher with a master's degree. If low nominal returns of 4 percent per year were earned on investments, the nominal value of the account at age 60 (when it can be withdrawn without penalty) would be \$266,062. If high annual returns of 10 percent were earned on investments, the nominal value of the account at age 60 would be \$700,242. Currently, these funds could be used to purchase a single life annuity through the Washington State Investment Board's Total Allocation Portfolio Annuity that would provide annual benefits of between \$18,648 (assuming low returns) and \$49,092 (assuming high returns).²⁴

²³ The minimum contribution level, which is also the default plan, is 5 percent. See Appendix C for details.

²⁴ See the WSIB TAP annuity calculator at <u>https://mpl.newkirkone.com/summitup/Control.aspx</u>.

Table 1. Key Features of TRS Retirement Plans

	TRS1	TRS2	TRS3	
Membership Definition	Hired pre-1977	Hired 1977 – 1996 (<i>default</i>) Hired 2008 – pres. (<i>opt in</i>)	Hired 1977 – 1 Hired 1996 – p	996 (<i>opt in</i>) res. (<i>default</i>)
Туре	Traditional Defined Benefit	Traditional Defined Benefit	DB Component	DC Component
Employee contribution rate	6% of salary	Variable: equal to at least 50% of cost of funding plan ²⁵	0%	5-15% (teacher's choice) ²⁶
Vesting period	5 years	5 years	10 years ²⁷	N/A
Retirement eligibility	30 SCY, or 60 yrs of age, or 55 yrs of age & 25 SCY	 65 yrs of age, or 62 yrs of age & 30 SCY (full benefit), or 55 yrs of age & 20 SCY (reduced benefit) 	 65 yrs of age, or 62 yrs of age & 30 SYC (full benefit), or 55 yrs of age & 10 SYC (reduced benefit) 	Withdrawal ages and penalties for early withdrawal dependent on Federal tax rules.
Average Final Compensation	Average salary during two highest- paid consecutive fiscal service years	Average salary during 60 highest- paid consecutive service credit months	Average salary during 60 highest- paid consecutive service credit months	N/A
Annual benefit formula	Annual Benefit = 0.02*ACF*SCY	Annual Benefit = 0.02*ACF*SCY	Annual Benefit = 0.01*ACF*SCY	N/A
Cost of living adjustments	After retirement and no sooner than age 66, benefits are adjusted by a $COLA$. ²⁸	Once a year, after the first full year of retirement, the benefit is adjusted by up to 3% per year	Once a year, after the first full year of retirement, the benefit is adjusted by up to 3% per year	N/A
Early Separation Inflation Protection	N/A	N/A	With 20 or more SCY, benefit increases by approx. 3% per year, each year teacher delays retirement (up to age 65)	N/A
Withdrawal from system	May withdraw employee contributions with interest.	May withdraw employee contributions with interest.	N/A – teacher does not contribute to DB component.	N/A - Funds are not tied to employer.

²⁵ Between 1979-2011, the TRS2 contribution rate averaged 4.63%, and ranged between 0.15% (in 2002) and 7.00% (in 1989).
²⁶ A teacher is offered six different contribution options. See Appendix C for details.
²⁷ A teacher can vest with 5 years of experience if at least one of those years is accrued at an age greater than or equal to age 44.
²⁸ The TRS1 COLA is determined at the State's discretion. Since 2011, there has been no COLA given to TRS1 pensioners.

IV. Pension Wealth

Several recent analyses of the separation and retirement incentives created by complex pension rules focus on the accrual of pension wealth over time (e.g., Costrell and Podgursky, 2009; Friedberg and Turner, 2011; Friedberg and Webb, 2005). We use the concept of net pension wealth to inform the discussions that follow of the trade-offs between TRS2 and TRS3, and of teacher preferences for pensions. Here we describe how we estimate pension wealth for the DB and DC components of the TRS plans. Our specific approach, which approximately follows Costrell and Podgursky (2009), is detailed in Appendix A.²⁹

The concept of pension wealth puts the value of DB and DC pensions in a common metric. A DB pension, which pays a retiree monthly benefits for the duration of life, functions in essentially the same way as an annuity. The pension wealth value of a DB pension can then be thought of as the size of the 401(k) that would be needed to purchase an annuity providing the same level of monthly benefits. The value of a DC pension is simply the size of the account at the time of separation. In both cases we net out employee contributions (which gives us *net* pension wealth) and discount the pension wealth to its present value at the time an employee was hired, which is when new Washington State teachers make their choice between TRS 2 and TRS 3. We assume a discount rate of 4 percent, which includes an inflation rate of 2 percent.

To illustrate the estimation of net pension wealth, consider Figure 2, which represents the net pension wealth estimates of a new female teacher with a master's degree and a career beginning at age 25. Her life span is modeled probabilistically using survival probabilities derived from the TRS mortality tables reported in the Washington State 2010 Actuarial Valuation Report (2011).³⁰ The DB components of TRS2 and TRS3 assume a wage growth rate of 2 percent and an annual COLA of 2 percent in retirement. We assume that the teacher chooses when to begin collecting retirement benefits such that net DB pension wealth is maximized. The DC component of TRS3 assumes real returns (above inflation) to investment of between 2 percent and 8 percent,³¹ and an employee contribution rate of 5 percent. Under TRS2, we also assume a contributions to the plans are netted out. For simplicity, we do not net out contributions made by the employer.³² Note that the horizontal axis represents separation age, which is not generally the same as retirement age.

²⁹ An important difference in our approach is that we estimate the present value of pension wealth at the time a teacher is hired, rather than when a teacher separates. We are interested in the point in time when a teacher is choosing a pension plan.

³⁰ DB pension wealth estimates for males are smaller because they have lower life expectancies.

³¹ A teacher's expectations about returns to DC assets will have a large effect on how large she expects her retirement benefit to be under TRS3. Washington State currently assumes average annual returns of 8 percent. However, many economists expect far lower returns looking forward. Shiller (2006) uses U.S. and international historical data to simulate returns to assets in a moderately aggressive life-cycle investment plan and estimates a median return of 3.1 percent, and 25th and 75th percentile returns of 2.2 percent and 4.0 percent respectively. ³² Netting out employer contributions would not change the shape of the TRS2 plot relative to the TRS3 plot because the employer contribution rates are the same for both plans. Inclusion of employer contributions in the

model would also require assumptions about what portion of deferred compensation would be translated into current compensation if pension payments were reduced or eliminated.

The plots in Figure 2 each start at zero pension wealth, and grow slowly until vesting at age 30 for TRS2, and age 35 for TRS3. The TRS3 plot jumps again at age 45 when with 20 SCY, the teacher becomes eligible for the early retirement adjustment, which increases benefits by approximately 3 percent each year retirement is delayed (up to age 65). Both plots jump at age 55 due to the accrual of 30 years of experience, which enables the teacher to begin drawing benefits early under relatively generous ERFs starting at age 55, and full benefits at age 62. When the teacher in Figure 2 reaches eligibility to begin collecting full retirement benefits, delaying separation corresponds with falling net pension wealth. Here, the cost of forgoing pension payments outweighs the benefits adding experience and potentially increasing average final compensation.

The defined benefit component of TRS3 (represented by the dotted line) appears to be the lower bound of net TRS3 pension wealth. Here we have assumed that the lower bound of nominal returns to investment and the discount rate are both equal to 4, which results in zero net returns to the DC component. The retirement benefit formula for the DB component of TRS3 is half as large as the TRS2 benefit formula. These proportions are not represented in Figure 2 because it plots *net* benefits, and the teacher contributes to TRS2, but does not contribute to the DB component of TRS3.



Figure 2. Present Value of Net Pension Wealth, TRS2 and TRS3 (Teacher with a Master's Degree)³³

³³ The example we use assumes the teacher is female, as females have different life expectancies and thus different payment projections.

V. Comparing TRS2 and TRS3

In this section, we compare the TRS2 and TRS3 plans in terms of contribution decisions and risk, portability, and retirement timing. An enrollee is likely to decide which plan best fits her preferences based in part on these criteria. In Section VII, we examine the actual decisions teachers make when choosing between TRS2 and TRS3.

Choice and Risk

A major difference between TRS2 and TRS3 is how much control an employee has over retirement assets. Under TRS2 the contribution rate is determined by the state according to the cost of funding the plan. An employee does not make any decisions as to how contributions are managed, nor is the retirement benefit tied to contribution rates and investment performance. In contrast, under TRS3 an employee chooses the contribution rate and can decide how the funds in the DC component of the retirement plan are managed. As such, employees who value choice for its own sake, or who have high expectations about investment returns, may tend to favor TRS3. Similarly, employees who desire a hands-off approach to financial management, or lack confidence in making investment decisions, may tend to favor TRS2.

Personal control over one's account contributions under TRS3 is accompanied by exposure to investment risk. While both plans provide a guaranteed retirement benefit for life, the guaranteed benefit under TRS3 is half as large, and an enrollee cannot be certain about the future size of the DC component. The stylized pension wealth estimation in Figure 2 represents a smooth accrual of pension wealth under TRS3, but DC assets are subject to considerable volatility if invested in moderate to high-risk funds. For example, the S&P 500 recorded an annual return of -37% 2007, followed by a positive return of 26% in 2008. In contrast, TRS2 enrollees face no investment risk as the size of the retirement benefit is decoupled from investment performance. Their risks are limited to fluctuations in the contribution rate, which is capped at six percent. An employee's pension preference is likely to depend on tolerance for risk, with a more risk-averse employee tending to favor TRS2.

Portability

The portability of retirement benefits is considered here in terms of the degree to which an employee leaving a job (i.e. "separating") can maintain retirement wealth. Looking closely at the net pension wealth implications of separating before retirement in Figure 2, we see advantages to each plan over different time periods for an employee beginning a career at age 25.

If the employee in **Figure 2** separates between zero and five years of employment, neither plan results in the accrual of significant net pension wealth because the employee is not yet vested. Between five and ten years of employment, an employee will be vested under TRS2, but not under TRS3, and is therefore, if separated, better off under TRS2. If the employee in **Figure 2** separates with between 10 and 20 years of experience, neither plan holds a clear

advantage.³⁴ At age 46, with the accrual of 20 SCY, the TRS3 employee becomes eligible for a benefit increase of approximately 3 percent for each year retirement is delayed, up to age 65. The result is that TRS3 is advantageous if the employee separates between the ages of 45 and 55. At age 55, when the employee has accumulated 30 SCY, it is advantageous to separate under TRS2 unless investment returns are very strong. What drives the sudden increase in TRS2 net pension wealth is that with 30 SCY, the employee is eligible to retire early under relatively generous ERFs.

A new 25-year-old teacher choosing between TRS2 and TRS3 may consider expectations about career length and make a choice accordingly. From a net pension wealth perspective, the teacher would tend to favor TRS2 if separating with between five and 20 years of experience, and TRS3 if separating with between 20 and 30 years of experience.

A different aspect of the relationship between pension plan structure and separation is whether the plans create incentives that could influence the timing of separation. In both plans we observe discontinuous jumps in net pension wealth that are driven by rules that govern defined benefits. Under TRS2, these occur with five years of experience (vesting), and the accrual of 30 years of experience and 55 years of age (which enables early retirement). Under TRS3 we observe similar jumps in net pension wealth, but vesting occurs after 10 years of experience and an additional jump occurs with eligibility for an early separation adjustment after 20 years of experience. We expect that an employee will tend to avoid separation if she is close to accumulating a combination of age and experience that would result in one of these discontinuities, because the marginal financial benefit of staying is particularly high in those years.

One TRS2 rule that is not represented on the pension wealth graphs, but which may have a significant influence on separation timing for some employees, is the provision of health care benefits during retirement. Both TRS2 and TRS3 provide a health care benefit. However, under TRS2 a retiree is eligible for coverage only if she retires immediately after separating. Therefore, separating under TRS2 before eligibility for early retirement at age 55 imposes a potentially significant cost in the form of lost health care benefits.

Retirement Timing

While maximizing net pension wealth is not necessarily the primary goal of an employee, we expect retirement timing to correlate with strategies that get the most out of the retirement benefit. Optimal retirement timing (maximizing net pension wealth) for a given combination of age and experience at separation is the same under both TRS2 and TRS3. Both are driven by rules governing eligibility for defined benefits. Perhaps the most important threshold is the accumulation of 30 SCY, which enables early retirement with a relatively generous ERF.³⁵ When

³⁴ Recall that the employee represented in **Figure 2** is a female with a master's degree who begins her teaching career at age 25. Furthermore, we assume contribution rates of 5 percent for TRS2 and TRS3 respectively, and returns to TRS3 assets of between 2 percent and 8 percent over inflation. Net pension wealth under TRS3 could be higher if higher returns to DC assets are earned.

³⁵ In 2008, the early retirement factors for teachers with 30 or more years of experience were adjusted to be more generous. See Table 1 in Appendix C for details.

an employee has accumulated 30 SCY and 55 years of age, it is optimal to retire in the same year as separation. Otherwise, it is optimal to delay retirement until age 65. Once an employee becomes eligible for full benefits, she incurs a large cost in the form of foregone pension payments for every year she delays retirement. Under TRS3, however, the magnitude of these incentives is smaller because the defined benefit is approximately half as large. Furthermore, the extent to which an employee may feel financially ready to retire may depend in large part on the investment performance of DC assets.

VI. Observing Teacher Choices between TRS2 and TRS3

Four Enrollment Periods

All active teachers are enrolled in TRS1, TRS2, or TRS3. Teachers' eligibility for these plans depends on when they were hired. As shown in **Figure 3** below, new Washington State teachers have enrolled in the three different pension systems during four distinct time periods: 1) During 1938–1977 all new hires were enrolled into TRS1; 2) During 1977–1996 all new hires were enrolled into TRS2; Since July 1996, these teachers have had the opportunity to transfer to TRS3, and between July 1996 and January 1998 were offered a transfer payment to do so; 3) During 1996–2008 all new teachers were enrolled into TRS3; 4) Since 2008, new hires have been able to choose between TRS2 and TRS3.



Figure 3. Teacher Enrollment Options

During two of these time periods teachers were able to choose between TRS2 and TRS3, and we can analyze teacher preferences for traditional and hybrid pension plans. In the first instance, during 1996–1997, we observe the decision to switch from TRS2 to TRS3 among a

relatively older and more experienced group of teachers. During this time period the transfer payment offered to TRS2 enrollees switching to TRS3 was increased once.³⁶ In the second instance we observe the decisions of newly hired teachers to enroll in TRS2 or TRS3.

Financial Incentives to Switch from TRS2 to TRS3 during 1996-1997

The legislation that established TRS3 in 1996 (HB 1206, Laws of 1995) afforded teachers who enrolled in TRS2 between 1977 and 1996 the opportunity to switch to the TRS3 plan. Teachers switching to TRS3 would receive a transfer payment equal to 20 percent of their accumulated contributions to TRS2. The legislation itself does not provide reason for the transfer payment, but a letter DRS dated April 15, 1996 informing teachers of the transfer payment refer to it as a "20% bonus for transferring to TRS Plan 3." As stated in the 1995 legislation:

Members...who request to transfer to plan III by January 1, 1998, shall have their account in the defined contribution portion of plan III... increased by twenty percent of their plan II accumulated contributions as of January 1, 1996. (Section 303.1.d)

In 1997, the payment for transferring to TRS3 was raised such that employees would have their accounts in the DC portion of TRS3 increased by *forty percent* of their accumulated TRS2 contributions. Again, the legislation (HB 1098, Laws of 1997) does not provide reason the transfer payment amount. However, a formal DRS communication about the increase mailed to teachers dated May 20, 1997 explains:

This legislative change was made because recent actuarial data indicated that the larger transfer payment was required to maintain the neutral fiscal impact that Plan 3 legislation was intended to have.

The memo also included information on each recipient's estimated 1996 account balance and the amount of the 40 percent transfer payment should the teacher decide to transfer. Whatever the state's motivation for changing the size of the transfer payment, from the perspective of teachers enrolled in TRS2, the financial incentives associated with switching to TRS3 changed positively.

In 1998, the financial incentive to transfer to TRS3 was again increased, such that a transferring employee had the DC component of the TRS3 account increased by 65 percent of accumulated TRS2 contributions. The legislation (HB 6306, Laws of 1998) was first read in the legislature on January 15,1998 and signed by the governor on April 15, 1998, well after the deadline to transfer had passed.³⁷ The increase was applied retroactively to all employees who transferred to TRS3 between July 1996 and January 1998. Although the bill was adopted after the transfer period, TRS2 enrollees were informed of the potential increase in a November 20, 1997 letter from Don Carlson, then a legislator and member of the Joint Committee on Pension Policy. The subject line of the letter read, "*Increase in bonus* for switching from TRS2 to TRS3."

The size of the transfer payments to teachers depended on their accumulated contributions and interest. In general, transferring teachers with more experience and those with

³⁶ It was increased a second time by legislation adopted in 1998, after the transfer period expired. However, TRS2 enrollees were informed of the pending legislation in a letter dated November 20, 1997, from the Don Carlson, Chair of the Joint Committee on Pension Policy.

 $^{^{37}}$ The legislation was passed by comfortable margins: 46 - 1 by the Senate and 64 - 33 by the House of Representatives.

higher salaries received larger payments. The average experience level among teachers eligible to transfer to TRS3 in 1996–1997 was 10.5 years. At current salary levels, a teacher with 10 years of experience will have accumulated roughly \$36,000 in contributions and interest under TRS2. The corresponding 20 percent, 40 percent, and 65 percent transfer payments would be \$7,200, \$14,400, and \$23,400 respectively. Under the 65 percent payment, a teacher with five years of experience would have received approximately \$9,800 and a teacher with 15 years experience approximately \$43,000.³⁸

Date	Action
January 14, 1997	Legislation increasing transfer payment to 40% introduced in legislature (HB 1098).
February 18, 1997	Memo mailed to TRS2 enrollees refers to 20% transfer payment.
April 15, 1997	HB 1098 signed by governor, increasing transfer payment to 40% .
May 20, 1997	Memo mailed to TRS2 enrollees refers to 40% transfer payment
November 20, 1997	Letter informing teachers that the JCPP was recommending legislation that would increase the transfer payment for TRS3 enrollees.
December 31, 1997	Deadline to Switch with Transfer Payment
January 15, 1998	Legislation increasing transfer payment to 65% introduced in legislature (HB 6306).
April 3, 1998	HB 6306 signed by governor, increasing transfer payment to 65% .

Table 2.	Timing of	f Transfer	Payment	Increases ³⁹
I abic 2.	i ming v	I II anoici	1 ayment	Inci cases

Figure 5 shows the frequency of teacher transfers from TRS2 to TRS3 between July 1, 1996 and December 31, 1997. This descriptive data does not enable inference about the causal relationship between the frequency of teacher transfers and the size of the transfer payment because the transfer deadline never changed. Transfers increased dramatically in December 1997 when teachers are likely to have heard about the potential increase to a 65 percent transfer payment, but many of the same teachers may have switched without the increased payments. More sophisticated statistical techniques would be needed to differentiate between those who were influenced by the payment levels and those who were merely procrastinating.

³⁸ These figures are a rough approximation of what a transferring teacher is likely to have received. We use a current salary schedule for a teacher with a master's degree, and assume a 6.5 percent contribution rate and 5.5 percent interest accumulation, compounded quarterly. The 6.5 percent contribution rate is based on the average TRS2 contribution rate in the decade preceding 1996. Historical TRS2 contribution rates can be found at http://www.drs.wa.gov/employer/EmployerHandbook/pdf/trs2elected.pdf.

³⁹ Samples of the letters sent to teachers regarding increases to the transfer payment can be found in Appendix E.



Figure 4. Frequency of Teacher Transfers from TRS2 to TRS3, July 1996 - December 1997

VII. Data

Washington State offers an ideal case study of teacher pensions and retirement behavior because the state has, at certain points, allowed teachers to choose between two different retirement systems. These choice periods can provide insights into the type of teachers who prefer different retirement plan options. Another advantage is that multiple state agencies maintain records on teachers that can be linked over multiple years to provide a rich profile of their individual characteristics, behavior, and work environments. This type of panel data allows detailed analysis of how plan structures influence teacher behavior such as separation and retirement timing, and ultimately provides the ability to make inferences about how retirement incentives impact the overall quality of the teacher workforce.

The data for this report derive primarily from teacher-level administrative records from the Washington State Office of Superintendent for Public Instruction (OSPI) S-275 personnel reporting system, Department of Retirement Services (DRS), and Professional Education Standards Board (PESB). These data are supplemented with school- and district-level information from the Washington State Report Card (WSRC) and the National Center for Education Statistics Common Core of Data (CCD). The data used for this study include all public school primary and secondary teachers in Washington State from SY 1996 to SY 2010, with over 100,000 unique teachers and over 800,000 teacher-year observations.

The S-275 data provide a foundation for linking additional data, because they include all teachers throughout the study period—each by year and with unique IDs. The data include information on teacher demographics, assignment, salary, and experience. Teacher certification and endorsement information from PESB. The data include the type and date of each teacher certification or endorsement as well as the institution that provided it. The match rate for linking datasets was in most cases very high (see Appendix B for details). The DRS retirement data include complete records of all transactions teachers had with DRS from the beginning of their career until December 2010. These data match the S-275 at a rate just over 99.5 percent for SY 1996 to SY 2009, and at 97.0 percent for 2010 when data for only half of the year was available.

The WSRC data contain information on student demographics, student achievement on standardized tests, and education staff characteristics at the school and district levels. The data are available from SY 2002 to present. The CCD data contain information on student demographics and educational staff by school and district from SY 1987 to present. The CCD LEA Finance Survey provides information on district level finances, which includes revenues and expenditures in different categories such as instruction, administration, etc. Over 95 percent of teachers were matched to school level information in all years. The vast majority of teachers were matched to district level information in all years.

In the analysis below, we focus on two groups of teachers who at some point had an opportunity to choose a retirement plan: those originally hired into TRS2 and those hired from SY 2008 to present. Considering the different timing of their decisions and the different incentives offered, there is good reason to consider these separately. For the choice sub-group hired into TRS2, we present data from SY 1998, which is the year the vast majority made the decision to switch plans. In 1998, over 30,000 teachers were in this group. For the group hired SY 2008 to present, we present data from SY 2010. By that year, over 5,000 new teachers had entered the retirement system.

VIII. Descriptive Findings

This section provides descriptive analyses of teacher characteristics and preferences for TRS2 and TRS3 pension plans as well as teacher separation and retirement behavior under TRS2 and TRS3, utilizing the data described in Section VII.

Teacher and School Context Characteristics and TRS Plan Choice

Here we explore the relationship between teacher characteristics and preferences for pension type.⁴⁰ This descriptive analysis is intended to detail the landscape of how pension plan preferences were distributed across teachers, schools, and geographic characteristics at or near the time teachers chose between TRS2 and TRS3. We discuss how the choice varies with teacher characteristics in the context of existing literature and insights from our analysis of the structures

⁴⁰ Additional data related to the distributions of teacher characteristics by plan are available in Appendix D.

of TRS2 and TRS3. These discussions provide insight into how changing pension structures could potentially reshape the composition of the teacher workforce.

We focus on two groups of teachers: 1) The 1996–1997 choice cohort (30,430 teachers) who were enrolled in TRS2 between 1977–1996 and given the opportunity to transfer to TRS3, and 2) The 2008–2010 choice cohort (6,159 teachers) who as new hires were given a choice between enrolling in TRS2 or TRS3. Keep in mind that the 1996–1997 choice cohort received a financial incentive for switching to TRS3 (see Section VI) and as a group is older and more experienced than the 2008-2010 cohort. Also, teachers in the first cohort who did not actively make a plan choice were defaulted into TRS2, whereas teachers in the 2008–2010 cohort default plan is TRS3 if an active choice is not made.

Overall, we find that teachers in both choice cohorts were more likely to choose TRS3. The proportion of teachers choosing TRS3 is higher in the 1996-1997 cohort (73 percent) than the 2008–2010 cohort (58 percent). As shown below, the pattern of stronger preference for TRS3 holds across most subgroups. Also, the pattern of a stronger preference for TRS3 among the 1996–1997 cohort holds across most subgroups. The only exception was among teachers aged 56-60.

School-Level Characteristics

We observe relatively small differences for both choice cohorts between elementary, middle, and high school teachers in pension plan choice. Similarly, there are only small differences for teachers based on geographic location and for those serving in a challenging workplace (as evidenced by the percentage of Title I students served by the school). This last finding is somewhat surprising given that portability of a pension is more likely to be an issue for teachers working at challenging schools since they might anticipate shorter tenures due to the relatively difficult nature of the work (e.g., Goldhaber et al., 2010; Scafidi et al., 2007).⁴¹

	1996–1	997 Choice C	ohort	2008-	2010 Choice C	Cohort
	TRS2	TRS3	Obs	TRS2	TRS3	Obs
All Teachers	0.27	0.73	30,430	0.42	0.58	6,159
Elementary	0.27	0.73	13,084	0.44	0.56	2,970
Middle	0.26	0.74	5,018	0.40	0.60	1,065
High School	0.25	0.75	6,631	0.38	0.62	1,613
Other	0.31	0.69	1,836	0.45	0.55	300
Rural	0.25	0.75	6,384	0.49	0.51	974
Town	0.22	0.78	2,658	0.45	0.55	711
City	0.28	0.72	17,527	0.39	0.61	4,266
Non-Title I	0.26	0.74	13,050	0.39	0.61	2,562
Title I	0.28	0.72	10,596	0.44	0.56	3,353

Table	3. '	Teacher	Plan	Choice	bv	School-level	Characteristics
1 abic	••	I cachel	1 mm	Choice	v j	School level	Character istics

⁴¹ TRS3 is somewhat less portable than TRS2 in the short run given that it has a 10-year vesting period compared to five years for TRS2.

Teacher-Level Characteristics

We observe some interesting differences in the proportion of teachers choosing one plan over another that are correlated with teacher and schooling attributes (see **Table 4**). In both choice cohorts, women were less likely to choose TRS3 than were men. As discussed previously, TRS3 is less likely to appeal to risk averse individuals because the retirement benefit amount is less certain, and studies find that women are more risk averse than men and more likely to chose plans that they do not have to actively manage and/or DB over DC plans (e.g. Brown and Weisbenner, 2009; Clark et al., 2006).⁴² A straightforward explanation for the stronger preference for TRS2 among women is that they have longer life expectancies than men, which increases the value of receiving pension payments for life.

		1996–1997 Choice Cohort			2008–20	10 Choice (Cohort
		TRS2	TRS3	Obs	TRS2	TRS3	Obs
All Teachers		0.27	0.73	30,430	0.42	0.58	6,159
Gender	Female	0.28	0.72	21,471	0.43	0.57	4,617
	Male	0.24	0.76	8,959	0.38	0.62	1,542
	Asian	0.36	0.64	622	0.41	0.59	210
	Black	0.45	0.55	473	0.45	0.55	115
Race	Hispanic	0.34	0.66	619	0.36	0.64	254
	Am. Indian	0.35	0.65	254	0.55	0.45	44
	White	0.26	0.74	28,462	0.42	0.58	5,536
Educational	Bachelors	0.30	0.70	13,495	0.43	0.57	3,505
Degree	Master's	0.24	0.76	16,555	0.40	0.60	2,513
C	Doctorate	0.42	0.58	175	0.50	0.50	34
Certifications	Math	0.24	0.76	2,283	0.37	0.63	470
	Science	0.25	0.75	3010	0.37	0.63	283
Vears	Age	44.38	40.41	30,430	35.5	34.1	6,159
i cais	Experience	10.57	10.42	30,430	3.45	3.01	6,159

Table 4. Teacher Plan Choice by Teacher Characteristics

We observe significant differences among different ethnic groups in both choice cohorts, but the patterns are inconsistent. In the 1996–1997 cohort, white teachers are more likely to than other ethnic groups to transfer to TRS3. However, in the 2008–2010 cohort, both Asians and Hispanics are more likely than Whites to enroll in TRS3. It is not clear what may be driving these differences. In an analysis of the influence of race on investment decision-making, Gutter et al. (1999) find that while investment decision-making behavior differs by race, the differences result from other underlying factors and are not driven by race itself.

⁴² In a review of gender differences in economic experiments, Croson and Gneezy (2009) find significant differences in risk preferences. Dohmen and Falk (2011) conduct an experiment analyzing preferences for compensation structures, and find that women tend to sort into less risky compensation schemes.

In both choice cohorts, teachers with master's degrees and math or science certifications are more likely choose TRS3. Teachers with advanced degrees are on a higher salary schedule and and it is likely that teachers with math or science backgrounds are more likely to have employment options outside of teaching available to them. Relative earnings may well play a role in plan choice given that higher paid employees may be more willing to take on financial risks.⁴³ Brown and Weisbenner (2009), for instance, find that individuals are more likely to choose a DC over DB plan if they are well educated and have higher earnings.⁴⁴

The results for teacher experience are more nuanced, for while salaries rise with experience, suggesting TRS3 should be relatively more desirable, more experienced teachers are also closer to retirement, so there is greater financial risk associated with the DC portion of TRS3, particularly over the short-run. As we see in **Table 5**, there is a similar pattern of plan choice across age and experience in both the choice cohorts with TRS3 being more strongly favored by younger teachers. **Figure 5** shows the distribution of teacher age by plan choice for the 1996–1997 choice cohort.⁴⁵ These findings are broadly consistent with existing literature that surveys teachers about their preferences for retirement options (Goldhaber et al., 2010).



Figure 5. Age Distribution by Plan Choice: 1996–1997 Choice Cohort

⁴³ Microeconomic theory suggests that a person's risk averseness decreases when wealth increases.

⁴⁴ Interestingly, the authors find that this group exhibited a strong preference for the DC plan even when the financial terms were unfavorable. The authors speculate that such sub-optimal decision making among a group of individuals who would purportedly be the most financially sophisticated may result from poor information or understanding, overconfidence and unrealistic expectations of the market, concern about the political risks of DB systems, or placement of a high value on choice for its own sake.

 $^{^{45}}$ We do not present the age distribution of the 2008–2010 choice cohort because plan choice is made when a teacher is hired, and age does not vary significantly among new hires.

Teacher Effectiveness

Perhaps of greatest interest in terms of pension choice is the possibility that teacher preferences for a pension system type might be associated with their effectiveness in the classroom. There is significant policy concern about the overall quality of the teacher workforce and, in particular, whether teaching is drawing talented college graduates (e.g. Corcoran et al., 2004; Goldhaber and Liu, 2003; Hanushek and Pace, 1995; Henke et al., 1996; and LakDawalla, 2001) and speculation that the decline over time in the academic caliber of the teacher workforce may be related, at least in part, to the wage structure in teaching (Goldhaber, 2006; Hoxby and Leigh, 2004). In an analysis of the "push" and "pull" incentives created by DB pension structures in Missouri, Koedel and Podgursky (2012) conclude that these incentives have a small but negative influence on the overall effectiveness of the teacher workforce.

We can begin to explore the connection between teacher effectiveness and pension system choice for a subset of teachers in Washington State. Teachers in grades 4-6 can be matched to their students during the 2007–2010 school years, permitting the estimation of value-added job performance measures for those teaching students math and reading.^{46,47} We are able to estimate value-added performance measures for 2,768 teachers in the 1996–1997 choice cohort and 698 teachers in the 2008–2010 cohort. For the 1996–1997 choice cohort, these value-added measures post-date the pension choice period by 10–13 years. For the 2008–2010 choice cohort these value-added measures coincide with the choice period, but the estimates of teacher job performance are based on fewer years of matched student-teacher data.

Figure 6 reports the kernel density distribution of value-added estimates for teachers in math and reading in each choice cohort (Panel A is the 1996–97 choice cohort and Panel B is the 2008–10 choice cohort). The solid line is the effectiveness distribution for teachers choosing TRS2 and the dotted line is the distribution for teachers choosing TRS3.⁴⁸ The teacher effectiveness measures are centered at zero and are interpreted in terms of standard deviations of student test scores. For example, a valued added score of 0 means that a teacher is estimated to be as effective as the average teacher in the sample. A teacher having a score of 0.5, on the other hand, suggests that, all else equal, students in that teachers classroom score 50 percent of a standard deviation better than would have been expected given the student, class, and school characteristics that are accounted for in the model.

⁴⁶ We cannot calculate effectiveness estimates for a third-grade teacher because we do not have prior test scores for that teacher's students.

⁴⁷ The proctor of the state assessment was used as the teacher-student link for at least some of the data used for analysis. The 'proctor' variable was not intended to be a link between students and their classroom teachers so this link may not accurately identify those classroom teachers. However, for the 2009-10 school year, we are able to check the accuracy of these proctor matches using the state's new Comprehensive Education Data and Research System (CEDARS) that matches students to teachers through a unique course ID. Our proctor match agrees with the student's teacher in the CEDARS system for about 95 percent of students in math and 94 percent of students in reading.

⁴⁸ These individual effectiveness estimates reported are adjusted using empirical Bayes methods, which shrink estimates back to the grand mean of the population.

There is significant overlap in the distributions of effectiveness for those choosing one pension system versus another, but there is also a consistent pattern: for each choice cohort and each subject area, the average estimated performance of those teachers choosing TRS3 exceeds the average for teachers choosing TRS2, by about 2 to 3 percent of a standard deviation.⁴⁹ To put this figure in perspective, the 2 to 3 percent of a standard deviation differential in teacher effectiveness is similar in magnitude to the estimated difference in effectiveness between a novice teacher and a teacher with one to two years of experience.

⁴⁹ The higher average for the value-added of teachers choosing TRS3 is consistent for a number of model specifications (e.g. the inclusion of school fixed effects, a sub-sample of teachers in which multiple lagged student test scores can be included), though in some model specifications the differences in means are not statistically significant. For more detail on the value-added model specifications that were used to estimate teacher effectiveness, see Goldhaber and Theobald (forthcoming).

Figure 6. Value-Added Estimates by Pension Choice

Panel A. 1996-1997 Choice Cohort



Panel B. 2008-2010 Choice Cohort



Teacher Separation and Retirement Patterns Under Different TRS Plans

As discussed in Section VI, the rules that govern defined benefits in TRS2 and TRS3 incentivize separation timing. For TRS2, the experience thresholds that create discontinuous jumps in net pension wealth are at five years when a teacher becomes vested, and at 30 years when a teacher becomes eligible for early retirement with a generous early retirement factor (ERF). Under TRS3, the important thresholds are at 10 years when a teacher becomes vested, at 20 years when a teacher becomes eligible for early separation adjustments, and at 30 years with eligibility for generous early retirement. Figure 6 shows the percentage of teachers who separate by years of experience. The data include teachers enrolled in TRS2 or TRS3 at some point during the 1996–2010 time period. Since the first teachers to enroll in TRS2 were new hires in 1977, the majority of teachers who enrolled in TRS2 and TRS3 have not yet separated.



Figure 7. Percentage of Teachers who Separate, by Years of Experience

Note: Each vertex in Figure 7 represents the following ratio: (*number of teachers who separated at X years of experience*)/(*number of teachers with experience level* $\ge X$).⁵⁰

The pattern of separation in Figure 7 offers suggestive evidence that separation timing is influenced by the incentives created by some, though not all, pension plan rules. We see an increase in separations after five years of experience among TRS2 teachers who at that point are vested. Separations among TRS3 teachers do not respond to crossing its vesting threshold at 10 years, and show a delayed and modest increase after crossing the 20-year threshold. It is at the 20-year threshold that TRS3 separations briefly overtake TRS2 separations, which is consistent with where TRS3 net pension wealth overtakes TRS2 net pension wealth in Figure 2. The most dramatic response is to the 30-year threshold, after which separations increase substantially for both plans.

⁵⁰ The number of teachers with 30 years of experience is small because the earliest a teacher in our sample could have been hired is 1977.

The pension rules that incentivize retirement timing are concerned with both age and experience thresholds. For a given level of experience, age determines retirement eligibility and the size of the ERF. Teachers with 20 or more SCY are eligible to retire as early as age 55, but without 30 or more SCY the ERFs are relatively less generous (between 25 percent and 90 percent depending on age). The youngest age at which a teacher can retire with full benefits is 62, provided at least 30 SCY have been accumulated. For everyone else, full benefits are first available at age 65. Figure 8 suggests that teachers do respond to the retirement timing incentives created by pension rules. In particular, retirements spike at ages 62 and 65 where full benefits become available to teachers depending on their experience levels.





Note: Each vertex in Figure 8 represents the following ratio: (*number of teachers who separated at X years of experience*)/(*number of teachers with experience level* $\ge X$).⁵¹

IX. Conclusions and Future Research Directions

Defined benefit and defined contribution retirement plans provide individuals with different pathways to financially secure retirements. Though often ignored, pensions are a significant share of total compensation. Moreover, the structure of pensions creates incentives for teacher mobility and may influence workforce quality if there is a connection between particular pension structures and teacher effectiveness, i.e. some pension structures may be seen as more desirable to more effective teachers.

⁵¹ The number of teachers who have reached retirement age is small because the earliest a teacher in our sample could have been hired is 1977.

Researching teacher pensions is important not only because many teacher pension plans are currently underfunded (note, however, that Washington State has one of the more fiscally sound pension systems in the country), but also because of serious disagreements among researchers, policymakers, and unions over how changes to current pension systems might influence the quality of the teacher workforce. At present, the research base regarding whether a change in plan type would impact the quality of the teacher workforce is thin and inconclusive. Weller (2011) argues DB teacher pensions improve the overall distribution of teacher quality by increasing retention of experienced teachers. In contrast, Koedel and Podgursky (2012) find that DB pension incentives have a negative effect on the quality of the teacher workforce. Costrell, Johnson, and Podgursky (2009) suggest that "providing new recruits and career-changers (particularly in areas such as math and science) with choices may, at the margin, help attract some of the most mobile and academically gifted candidates who have the best nonteaching options" (p. 221). Teachers' unions (National Education Association, 2012), and teachers themselves (DeArmond and Goldhaber, 2010), tend to show a strong commitment to the traditional DB pension arrangement.

Washington's Teacher Retirement System has offered several cohorts of teachers a choice between a traditional defined benefit and a hybrid defined benefit/defined contribution plan, providing a natural experiment for assessing the implications of pension structure. In this paper we detail how the pension wealth accrual process differs between each of the two pension plans teachers can choose, and provide evidence about the type of individual who prefer each type of plan. The preliminary descriptive comparisons suggest that pension preferences appear to be distributed differently by working environment, gender, race, education, age, experience, and teacher performance. In particular, we observe that higher than average proportions of teachers with master's degrees and math or science certifications chose the hybrid TRS3 pension plan. We also observe that teachers who chose TRS3 are on average slightly more effective (as measured by value-added modeling) than teachers who chose TRS2.

Our findings hint at future research directions. That teacher pension preferences are distributed differently across a number of teacher characteristics suggests that the composition of the workforce is likely to be influenced by pension structures, and warrants further investigation into the causal relationship between pensions and workforce composition.

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APPENDICES

Appendix A: Calculating Pension Wealth

Appendix B: Data Sources and Merging

Appendix C: Appendix C: Washington State TRS Plan Details

Appendix D: Teacher Characteristics

Appendix E: Letters to Teachers Regarding TRS3 Transfer Payments

Appendix A: Calculating Pension Wealth

Much of the recent research on teacher pensions focuses on unpacking complex pension rule structures to reveal highly nonlinear patterns of deferred compensation (e.g. Costrell and Podgursky 2007). Pension wealth is the expected total lifetime value of a pension benefit at the time of separation. For DB plans, pension wealth is the discounted value of the stream of expected payments after retirement. This value approximates the size of the DC account required to purchase an equally generous annuity. In the case of DC accounts, pension wealth is simply the size of the account at the time of separation. The pension wealth concept is particularly useful for comparing the magnitude of deferred compensation between different retirement plans and differences in the wealth accrual process between plans over time.¹

The benefit, B, a retired Washington teacher receives in a given year depends on her plan, average final compensation (AFC), and service credit years (SCY), and also the early retirement factor (ERF) if she has opted for early retirement. The ERF depends on SCY and early retirement age (see Appendix C). AFC is average salary (S_A) of the teacher's five highest paid consecutive SCYs, which we assume to be the last five SCYs. Teacher salary S_A comes from the 2011 teacher salary schedule and is assumed to increase uniformly across SCYs and degree types at a 2.5% annual wage inflation rate. Normal retirement in TRS 2 requires that participants be at least 65 years old and have a minimum of 5 SCYs. Participants in TRS 3 must also be 65 years old and are required to have 10 SCYs. Participants qualify for early retirement in TRS 2 if they have at least 20 SCYs and in TRS 3 if they have at least 10 SCYs or 5 SCYs and earned one SCY after age 45. The early retirement benefit reduction is based off of the schedule of early retirement factors (ERF) with two levels depending on SCYs. TRS 3 participants with at least 20 SCY's who retire before age 65 are eligible for an inflation adjustment to their benefit at 3 percent per year of delay, compounded monthly. To summarize, the benefit for a new teacher is determined as follows:

$$SCY = A_s - A$$

$$AFC = \sum_{A_{s-5}}^{A_s} S_A (SCY, Degree) / 5$$

$B_{TRS2}(A_f A_s) = 0.02 \cdot SCY \cdot AFC,$
$B_{TRS2}(A_f A_s) = ERF_{high}(A_s, SCY) \cdot 0.02 \cdot SCY \cdot AFC$
$B_{TRS2}(A_f A_s) = ERF_{low}(A_s, SCY) \cdot 0.02 \cdot SCY \cdot FAS,$

for $A_r \ge 65, SCY \ge 5$ for $A_s < 65, 55 \le A_r < 65, SCY \ge 30$ for $A_s < 65, 55 \le A_r < 65, SCY \ge 20$

¹ Though DB pension wealth is the value of the DC account required to purchase an equivalently generous annuity, DC account holders do not actually have this opportunity until they separate and/or reach age 59 1/2.

$$\begin{split} B_{TRS3}(A_f | A_s) &= 0.01 \cdot SCY \cdot AFC, & \text{for } A \leq 45, A_r \geq 65, SCY \geq 10 \\ B_{TRS3}(A_f | A_s) &= 0.01 \cdot SCY \cdot AFC, & \text{for } A \geq 46, A_r \geq 65, SCY \geq 5 \\ B_{TRS3}(A_f | A_s) &= ERF_{high}(A_s, SCY) \cdot 0.01 \cdot SCY \cdot AFC, & \text{for } A_s < 65, 55 \leq A_r < 65, SCY \geq 30 \\ B_{TRS3}(A_f | A_s) &= ERF_{low}(A_s, SCY) \cdot 0.01 \cdot SCY \cdot AFC, & \text{for } A_s < 65, 55 \leq A_r < 65, SCY \geq 10 \\ B_{TRS3}(A_f | A_s) &= ERF_{low}(A_s, SCY) \cdot 0.01 \cdot SCY \cdot AFC, & \text{for } A_s < 65, 55 \leq A_r < 65, SCY \geq 10 \\ B_{TRS3}(A_f | A_s) &= (1 + .03/12)^{(A_r - A_s) \cdot 12} \cdot 0.01 \cdot SCY \cdot AFC, & \text{for } A_s < 65, A_r \geq 65, SCY \geq 20 \end{split}$$

where A_f is the age upon receiving a benefit payment; A_s is the age at separation; A is the age at present; and A_r is the age at retirement.

We define the present value of a teacher's current defined benefit pension wealth, P_{DB} , at the present age, A, conditional on separation at age, A_s , and retirement at age A_r , as the sum of the present value of the entire stream of future benefit payments²:

$$P_{DB}(A|A_s, A_r) = \sum_{A_f \ge A_r} (1+r)^{(A-A_f)} \cdot f(A_f|A) \cdot B(A_f|A_s, plan) \cdot COLA_{A_f}$$

where *r* is the discount rate; $f(A_f|A)$ is the conditional probability of survival³; $B_{TRS2}(A|A_s)$ is the size of the future benefit payment; and $COLA_{A_f}$ is the applicable cost of living adjustment. To estimate $P_{DB}(A|A_s)$, we assume a discount rate of 4%. The survival probability is calculated based on the adjusted RP-2000 mortality tables used by the Washington State Office of the State Actuary provided in the 2010 Washington State Actuarial Valuation Report. To calculate this we use $f(A_f|A) = \prod_A^{A_f} p_x$, where p_x denotes the probability of survival to age x + 1 conditional on having survived to age x.

Since the unadjusted benefit paid to retirees does not change over time, we can separate the benefit payment from the discounting, survival, and cost of living adjustments, and summarize that by a single 'lifetime benefit factor', *LBF*.

$$P_{DB}(A|A_s, A_r) = B(A_f|A_s) \cdot \sum_{A_f \ge A_s} (1+r)^{(A-A_f)} \cdot f(A_f|A) \cdot COLA_{A_f}$$

 $P_{DB}(A|A_s) = B(A_f|A_s) \cdot LBF(r, A_f, A_r)$

To simplify the presentation of the pension wealth graphs, we choose the retirement age at a given age of separation that provides the highest level of pension wealth and use only that value. In reality, teachers who separate may retire at a number of different ages.

² This specification is similar to Podgursky and Costrell (2010) but differs in that it discounts to some age prior to separation rather than the age of separation, and that it explicitly incorporates benefit adjustments. ³ The supplicitly provide are behilded as the set of the set

³ The survival probability prior to retirement is considered equal to one.

Since teachers in different plans have different contribution rates, we also calculate teacher contributions (C_A) to their retirement plan in order to determine net pension wealth, P_{DB_Net} . Each pay period, a teacher contributes a percentage of her salary to her retirement plan based on a current contribution rate (c). The contribution rate for TRS 2 varies over time. We use the ten year average between 2000 and 2010 of 2.4 percent. Annual contributions are:

$$C_A = c \cdot S_A$$

The present value of total lifetime contributions are:

$$TC = \sum_{A}^{A_s} (1+r)^{A-A_f} \cdot C_A$$

Under TRS 2, if a TRS 2 participant meets the vesting requirements, the present value of net pension wealth is the present value of their benefit less the present value of their future contributions. If she does not vest, she may withdraw her contributions with 6 percent interest. TRS 2 pension wealth can be described as follows :

$$P_{TRS2}(A_s|A) = \sum_{A}^{A_s} (1+0.06)^{A_f-A} \cdot C_A - TC_{TRS2} \quad \text{for } SCY < 5 \text{ years}$$

$$P_{TRS2}(A_s|A) = P_{DB_TRS2} - TC_{TRS2} \quad \text{for } SCY \ge 5 \text{ years}$$

The DC component of the TRS 3 plan is made up entirely of employee contributions. Each year employees make contributions to their DC accounts and in the next year earn interest (i_t) on all previous contributions based on the performance of their assets. Since participants may have different investment strategies and expectations of i_t , we consider it at two constant levels: 2.2% and 8% returns above inflation. In general, the return on most investments fluctuates annually and the sequencing of that fluctuation may have a significant impact on the value of a DC account at any given time.

The value of the DC account at any given time is:

$$DC_1 = C_1$$

$$DC_2 = DC_1 \cdot (1 + i_t) + C_2$$

...

$$DC_s = DC_{s-1} \cdot (1 + i_s) + C_s$$

The present value of the DC account upon separation is:

$$P_{DC} = (1+r)^{A-A_s} \cdot DC_s$$

The present value of net pension wealth in TRS 3 is:

$$P_{TRS3}(A_s|A) = P_{DB_{TRS3}} + P_{DC} - TC_{TRS2}$$

Note that pension wealth in TRS 3 is determined by the defined benefit component *and* the earnings on the DC account net of contributions.

Table 1. Economic Assumptions

Discount Rate	0.04
Wage Growth Rate/Inflation Rate	0.02
Annual COLA Adjustment	0.02
TRS 2 Employee DB Contribution	0.05
Interest Paid on Withdrawn Contributions	0.055
TRS 3 Employee DC Contribution	0.05
Real Investment Returns (Low)	0.02
Real Investment Returns (High)	0.08
Teacher Education	Masters
Life Table	RP-TRS-F

Appendix B: Data Sources and Merging

The data for this report comes from Washington State teacher-level administrative records from the Washington State Office of Superintendent of Public Instruction (OSPI), Department of Retirement Services (DRS), and the Professional Educator Standards Board (PESB). Public information from the Washington State Report Card (WSRC) and the National Center for Education Statistics Common Core of Data (CCD) were also incorporated.

S-275

OSPI annually collects information on each teacher at each school in Washington State through its S-275 reporting system. The S-275 is an annual personnel-reporting process, which provides a record of certificated and classified employees of the school districts and educational service districts (ESD) of the state of Washington. Our data include observations for every employee included in S-275 from SY 1982 to SY 2011. For this report we restrict the data to only those in teaching positions from SY 1996 to SY 2010. The S-275 data uniquely identifies teachers (and other education personnel) with an ID that allows for linking over time and to other data sources.

The data items in the S-275 report fall into four categories: demographic information, state Legislative Evaluation and Accountability Program (LEAP) placement information, contract information, and assignment information. Demographics collected on each employee include the individual's name, certification number, age, gender, and ethnicity. LEAP placement information is collected for individuals with at least one duty assignment as a certificated employee. The data reported include highest degree type (bachelor's, master's, doctorate, vocational, and so on), the year the highest degree was awarded, academic and eligible in-service credits, and certificated years of experience. The contract information provides data on the certificated-based contract hours per full-time equivalent (FTE) day and the contracted number of days, final salary, and annual insurance and mandatory benefits. Assignments are distinguished by five variables: building, program, activity, duty, and grade group (PK, K, elementary, middle, and secondary).

DRS

The DRS maintains records of all individuals participating in a Washington State retirement plan. These records include the creation of a retirement account, transfer to a different type of retirement plan, separation, retirement, active choice versus default or mandatory enrollment, defined contribution rate, withdrawal of contributions, choice of

investment plan, and service credit years. Data for this report is based on a sample of all teachers who were active between SY 1996 and December of SY 2010. Each transaction includes the same teacher ID as the S-275, which allows these files to be linked.

PESB

PESB maintains records of teaching certifications and endorsements for all education professionals in Washington State. The records date from 1915 to present. These records may be linked through a crosswalk to the same teacher ID used in the S-275 records and the DRS records.

VAM Scores

Using student-level Washington Assessment of Student Learning (WASL) test scores linked to teachers, we calculated math and reading value added scores for elementary school teachers.

WSRC

The Washington State School Report Card provides parents, educators, policymakers, researchers and other stakeholders in Washington State with information about K-12 public schools (http://reportcard.ospi.k12.wa.us/DataDownload.aspx). It includes demographic information about students at the school, district and state levels, and data about student achievement on state-wide assessment. Achievement data include student performance on the WASL and HSPE tests, as well as a summary of each schools adequate yearly progress. It also provides information about teachers, administrators, and other school staff. Data is available from SY 2002 to SY 2010. WSRC data include IDs for school buildings and district, which allows for linking to the teacher level data.

CCD

The CCD provides school- and district-level information for all public elementary and secondary schools in the United States.

SCHOOL UNIVERSE SURVEY

The CCD School Universe Survey provides a complete listing of all public elementary and secondary schools in the US and provides basic information about school characteristics including location, type, student enrollment, race, FRL status, and number of teachers. This database reports general building information as well as student and staff counts. General building data encompass names, addresses, and telephone numbers; types of schools (regular, special education, vocational, and alternative); operational status; school flags (charter, magnets, Title I, and Title I Schoolwide); and level of school. Student demographic data include items such as membership counts by Pre-K–12 and ungraded, counts of FRL-eligible students, and counts by race/ethnicity. The staffing information includes FTE classroom teacher counts and pupil-to-teacher ratio. The building IDs used in this data allow for linking to teachers in the S-275. The data is available from SY 1987 to present.

LEA UNIVERSE SURVEY

The CCD LEA Universe survey data provides a complete listing of every school district in the US that provides free, public education. This database reports counts of students by demographic characteristics and staffing information including FTE classroom teacher counts and pupil-to-teacher ratio. The district IDs used in this data allow for linking to teachers in the S-275. The data is available from SY 1987 to present.

LEA FINANCE SURVEY

The CCD LEA Finance Survey provides information about revenues and expenditures for all school districts in the US. This includes information about the source of revenue – federal, state, local – and the categories of the expenditures – instruction, administration, etc. The data is available for SYs 1990, 1992, and 1995 – 2009.

Merging Data Files

The data used for this report is linked at the teacher-, school-, and district-levels by year and ID, and then finally combined into a single data file.

CCD CCD LEA WSRC WASL WSRC WASL CCD LEA PESB S-275 School District District School School Universe Finance Universe Merge Merge Merge Merge DRS District File School Merge VAM File Teacher File Teacher-School-District Teacher-School File Pension Analytic File

Figure. Diagram of Data Linkage Process

Matching rates by Data Source and Year

Teacher Data

S-275 & PESB							
SY	No Match	% Match					
1996	3	51,122	99.99%				
1997	4	52,869	99.99%				
1998	5	53,617	99.99%				
1999	6	54,286	99.99%				
2000	5	54,698	99.99%				
2001	4	55,297	99.99%				
2002	4	57,126	99.99%				
2003	6	57,976	99.99%				
2004	6	57,874	99.99%				
2005	6	58,210	99.99%				
2006	8	58,665	99.99%				
2007	4	59,086	99.99%				
2008	3	59,164	99.99%				
2009	3	59,582	99.99%				
2010	4	58,250	99.99%				
Total	71	847,822	99.99%				

	Merge with DRS-WSIPP						
SY	No Match	Matched	% Match				
1996	107	51,018	99.79%				
1997	117	52,756	99.78%				
1998	102	53,520	99.81%				
1999	93	54,199	99.83%				
2000	118	54,585	99.78%				
2001	127	55,174	99.77%				
2002	153	56,977	99.73%				
2003	156	57,826	99.73%				
2004	155	57,725	99.73%				
2005	173	58,043	99.70%				
2006	174	58,499	99.70%				
2007	221	58,869	99.63%				
2008	246	58,921	99.58%				
2009	228	59,357	99.62%				
2010	1,773	56,481	96.96%				
Total	3,943	843,950	99.53%				

Merge with VAM Scores							
SY	No Match	Match	% Match				
1996	47,589	3,429	6.7%				
1997	49,112	3,644	6.9%				
1998	49,603	3,917	7.3%				
1999	49,950	4,249	7.8%				
2000	49,952	4,633	8.5%				
2001	50,144	5,030	9.1%				
2002	51,398	5,579	9.8%				
2003	51,863	5,963	10.3%				
2004	51,436	6,290	10.9%				
2005	51,313	6,731	11.6%				
2006	51,313	7,187	12.3%				
2007	51,082	7,788	13.2%				
2008	50,910	8,012	13.6%				
2009	51,226	8,128	13.7%				
2010	48,557	7,921	14.0%				
Total	755,448	88,501	10.5%				

School Data

MERGE SCHOOL WSRC AND WASL					
SYEAR	No Match (WASL)	No Match (WSRC)	Matched	% Matched	
1997	*930	0	0		
1998	*1507	0	0		
1999	*1851	0	0		
2000	*1924	0	0		
2001	*1942	0	0		
2002	239	9	1,936	88.64%	
2003	58	133	1,824	90.52%	
2004	302	1	2,029	87.01%	
2005	143	13	2,062	92.97%	
2006	98	49	2,062	93.35%	
2007	187	1	2,134	91.90%	
2008	224	1	2,141	90.49%	
2009	278	1	2,151	88.52%	
2010	282	36	2,110	86.90%	
	1811	244	18,449	89.98%	

MERGE CCD SCHOOL UNIVERSE AND WSRC									
SYEAR	No Match (CCD)	No Match (WSRC- WASL)	Matched	% Matched					
1996	*2150	0	0						
1997	1,252	2	928	42.53%					
1998	746	7	1,500	66.58%					
1999	422	7	1,844	81.13%					
2000	403	11	1,913	82.21%					
2001	409	8	1,934	82.26%					
2002	176	9	2,175	92.16%					
2003	286	9	2,006	87.18%					
2004	22	71	2,261	96.05%					
2005	146	24	2,194	92.81%					
2006	102	13	2,196	95.02%					
2007	199	166	2,156	85.52%					
2008	176	186	2,180	85.76%					
2009	145	230	2,200	85.44%					
2010	105	165	2,263	89.34%					
	4,589	908	27,750	83.47%					

District Data

W	WSRC WASL & DISTRICT DEMOGRAPHICS									
SY	No Match (WASL)	No Match (WSRC)	Matched	% Matched						
1997	*233	0	0							
1998	*267	0	0							
1999	*277	0	0							
2000	*269	0	0							
2001	*263	0	0							
2002	0	26	270	91.22%						
2003	0	27	269	90.88%						
2004	0	34	262	88.51%						
2005	0	31	265	89.53%						
2006	0	21	275	92.91%						
2007	1	23	273	91.92%						
2008	1	25	270	91.22%						
2009	1	28	267	90.20%						
2010	0	27	268	90.85%						
Total	3	242	2419	90.80%						

LEA_UNIVERSE & LEA_FINANCE									
SY	No Match	Matched	% Matched						
1996	0	305	100.00%						
1997	0	305	100.00%						
1998	0	305	100.00%						
1999	0	305	100.00%						
2000	0	305	100.00%						
2001	0	305	100.00%						
2002	9	296	97.05%						
2003	9	296	97.05%						
2004	10	296	96.73%						
2005	10	296	96.73%						
2006	10	296	96.73%						
2007	12	296	96.10%						
2008	13	296	95.79%						
2009	5	304	98.38%						
2010	6	304	98.06%						
Total	84	4510	98.17%						

*Educational Service Districts were dropped from LEA Finance after 2001.

DISTRICT CCD AND WSRC									
SY	No Match	Matched	% Matched						
1996	*305	0							
1997	36	269	88.20%						
1998	9	296	97.05%						
1999	9	296	97.05%						
2000	9	296	97.05%						
2001	9	296	97.05%						
2002	9	296	97.05%						
2003	9	296	97.05%						
2004	10	296	96.73%						
2005	10	296	96.73%						
2006	10	296	96.73%						
2007	11	297	96.43%						
2008	13	296	95.79%						
2009	13	296	95.79%						
2010	15	295	95.16%						
Total	172	4117	95.99%						

	MER	GE TEACHER AND	SCHOOL	
SY	No Match (Teacher)	No Match (School)	Schools Matched	% Matched
1996	74	184	50,944	99.85%
1997	37	202	52,719	99.93%
1998	21	244	53,499	99.96%
1999	53	244	54,146	99.90%
2000	29	276	54,556	99.95%
2001	35	275	55,139	99.94%
2002	85	286	56,892	99.85%
2003	1,928	319	55,898	96.67%
2004	2,413	378	55,312	95.82%
2005	2,416	382	55,627	95.84%
2006	3,225	335	55,274	94.49%
2007	2,466	498	56,403	95.81%
2008	2,626	513	56,295	95.54%
2009	2,364	514	56,993	96.02%
2010	1,996	473	54,485	96.47%
	19768	5,123	824,182	97.66%

Teachers, Schools, and Districts

	MERGE TEACHERS-SCHOOLS AND DISTRICTS									
SY	No Match (Teacher-School)	No Match (Districts)	Teachers Matched	% Matched						
1996	0	2	51,018	100.00%						
1997	0	2	52,756	100.00%						
1998	4	2	53,516	99.99%						
1999	0	0	54,199	100.00%						
2000	0	0	54,585	100.00%						
2001	0	0	55,174	100.00%						
2002	0	0	56,977	100.00%						
2003	0	0	57,826	100.00%						
2004	0	1	57,725	100.00%						
2005	0	1	58,043	100.00%						
2006	0	2	58,499	100.00%						
2007	0	4	58,869	100.00%						
2008	0	7	58,921	100.00%						
2009	0	6	59,357	100.00%						
2010	62	11	56,419	99.89%						
	66	38	843,884	99.99%						

Appendix C: Washington Teacher Retirement System (TRS) Plan Details

Plan Component	TRS1	TRS2	TRS3
Type of plan	Defined Benefit	Defined Benefit	Hybrid: Defined Benefit and Defined Contribution
Membership	 Hired before October 1, 1977 (mandatory) 	 Hired Oct 1, 1977 to June 30, 1996 Hired July 1, 2007 to present (opt-in at time of hire) 	 Hired July 1, 1996 to June 30, 2007 (mandatory) Hired July 1, 2007 to present (default) Hired October 1, 1977 to present (can opt-in each January)
Annual Benefit	2% x SCY x AFC/12	2% x SCY x AFC	1% x SCY x AFC + DC contributions and investment returns
Service Credit Years (SCY)	 144 full-time days worked/year = 1 SCY Can earn a fraction for fewer days No service granted for less than 20 days 	 810 hours worked Can earn a fractio 0.5 SCY or 6 serv 	/year = 12 service credit months or 1 SCY n of SCY for less hours, e.g., 630-809 hours within 9 months = /ice credit months
Average Final Compensation (AFC)	Average of 2 consecutive highest paid fiscal years	Ave	erage of 60 consecutive highest paid service credit months

Plan Component	TRS1	TRS2	TRS3						
Employee Contribution Rates	6%	Variable, 0.15% to 4.7%	0% to DI For DC o A E 5% 5 all a age s 6 3	B compo compone B 5% to age 35 6% age 35-44 7.5% age 45+	nent ent, 6 options C 6% to lage 35 7.5% age 35- 44 8.5% age 45+	s (defa D 7% all age s	ult=A) E 10 % all age s	F 15 % all age s	
Employer Contribution rates	Variable	e, 3% to 8%	Variable, 3% to 8% to DB component 0% to DC component						
Vesting	5 SCY	5 SCY	 10 SCY; or 5 SCY, with 12 months earned after age 44; or 5 SCY in TRS2 prior to July 1, 1996 						
Normal Retirement Eligibility	 Any age with 30 years Age 55 with 25 years Age 60 with 5 years 		5 SCY in TRS2 prior to July 1, 1996 Age 65 with 5 SCY						
Early Retirement Eligibility	N/A	Minimum: Age 55 with	1 20 SCY		N	1inimu	m: Age	55 with 10 SCY	

Plan Component	TRS1	TRS2		TRS3					
Early Retirement Factors (ERF) for Benefit Reduction	N/A	ERF 20-29 SYC (T <u>10-29 SYC (TRS</u> 55: 0.358 56: 0.395 57: 0.435 58: 0.481 59: 0.531 60: 0.588 61: 0.652 62: 0.724 63: 0.805 64: 0.896 *Since 2008, early reti if they choose the pos	ERF for 30+ SCY S3) pre-2008* 55: 0.70 56: 0.73 57: 0.76 58: 0.79 59: 0.82 60: 0.85 61: 0.88 62: 0.91 63: 0.94 64: 0.97 irees with 30+ SCY can choose eight 50' can choose eight	ERF for 30+ SCY since 2008* 55: 0.80 56: 0.83 57: 0.86 58: 0.89 59: 0.92 60: 0.95 61: 0.98 62: 1.00 63: 1.00 64: 1.00 ther ERF, but cannot receive benefits					
Retirement Return-to-Work Conditions	 <30 days >30 days If retire ea 	after retiring: benefits r after retiring: full benefit arly with since-2008 ERF	Iter retiring: benefits reduced 5.5% every 7 hours worked, up to 140 hours/month Iter retiring: full benefits continue, up to 867 hours/calendar year with since-2008 FBFs, cannot work and receive pension benefits						
Gain Sharing	 Pre-2008: If prior 4 fiscal years average investment return > 10%, gains distributed to members proportionat e to SCY. Since 2008: gain sharing ended. 	None	 Pre-2008: If prior 4 fiscal yea distributed to members prop Since 2008: gain sharing end 	ars average investment return > 10%, gains ortionate to SCY. ded.					

Plan Component	TRS1	TRS2	TRS3
COLA formula	Before 2011: • Uniform COLA = SCY x amount determined by state actuary (\$1.88 in 2011) • After 2011: no automatic COLA	Percentage determine	d by state actuary based on the Consumer Price Index (CPI) up to max of 3%
In Social Security			Yes
Disability Retirement Benefit Formula	2% x SCY x AFC	2% x SCY x AFC (reduced by ERFs if retiring before age 65)	1% x SCY x AFC (reduced by ERFs if retiring before age 65)
Health Insurance after Retirement	TRS2: If you delay retirement benefit eligible for health PEBB.	/ receiving your , you will not be care coverage under	To qualify you must elect coverage within 60 days of termination. As long as you meet the age and service requirements of the plan (age 55 or older, with 10 or more years of service credit) you can delay receiving your retirement benefit and still be eligible for PEBB coverage.

Gain-Sharing in Effect (April 1998-June 2007)

The same law that created incentives to switch from TRS2 to TRS3 created gain sharing for TRS1 and 3, but not TRS2—a different monetary incentive to switch from TRS2 to 3 (Senate Bill 6306, Laws of 1998). "Gain sharing" is a mechanism that increases members' DC account balance when the state's pension fund investment returns are extraordinary.⁴ The state investment board calculates the amount of the investment return (taken from the pension fund balance) to be allocated to eligible TRS3 members per year of service, and those amounts are distributed to members' DC balances. There were three instances of gain sharing between 1998 and 2007; the last was for approximately \$228 per year of service for each TRS3 member (Legislative staff analysis of HB 2391, Laws of 2007).

In 2007, the gain-sharing feature was repealed in response to a finding from the state actuary that the practice—which reduces the balance of the pension fund— effectively lowers the long-term return from pension funds and subsequently raises future contribution rates (Legislative staff analysis of HB 2391, Laws of 2007). In place of gain sharing, current teachers were offered more generous early retirement—the option to retire with full benefits at age 62—and re-opened TRS2 to new teachers, who can now choose between TRS2 or TRS3 within their first 90 days of employment, or default into TRS3 if they do not make a choice during that window. These "replacement" early retirement benefits were assumed to represent 79 percent of the value of gain sharing. By making these changes across all TRS plans, the state estimated it would save over \$106 million in pension contributions in the short term and over \$1 billion through 2032 (Fiscal note from the Office of the State Actuary for House Bill 2391, Laws of 2007).⁵

⁴ Exceeding 10 percent for four consecutive fiscal years.

⁵ Shortly after the repeal, members and retirees of state pension plans 1 and 3 (including TRS) filed a class-action lawsuit to overturn the repeal of gain sharing on the basis that is a contractual right and that the replacement benefits were insufficient. In 2010, King County Superior Court ruled that the repeal was invalid, and in 2012, that the state could terminate the replacement benefits if gain sharing is reinstated. The state is appealing the 2010 decision. Currently, the replacement benefits without gain sharing remain in place.

Appendix D: Teacher Characteristics

Teacher Characteristics by Retirement Plan, All Teachers 2010

Group:	AI	I Teachers	;		TRS 1			TRS 2			TRS 3	
-	mean	sd	count	mean	sd	count	mean	sd	count	mean	sd	count
Age, Current	46	11	56481	61	3	3992	49	12	7738	45	10	44750
Age, Year of Hire	32	8	56480	25	2	3992	33	8	7738	33	8	44750
Female	0.72	0.45	56481	0.74	0.44	3992	0.76	0.43	7738	0.71	0.45	44750
Asian	0.03	0.16	56481	0.02	0.15	3992	0.03	0.16	7738	0.03	0.16	44750
Black	0.01	0.12	56481	0.01	0.12	3992	0.02	0.14	7738	0.01	0.11	44750
Hispanic	0.03	0.16	56481	0.01	0.11	3992	0.03	0.16	7738	0.03	0.17	44750
American Indian	0.01	0.09	56481	0.01	0.08	3992	0.01	0.11	7738	0.01	0.09	44750
White	0.93	0.26	56481	0.95	0.23	3992	0.91	0.28	7738	0.93	0.26	44750
Experience	14	9	56481	30	7	3992	15	10	7738	13	8	44750
Total Salary	\$62	\$15	56267	\$70	\$15	3954	\$62	\$16	7696	\$61	\$15	44616
Bachelors	0.32	0.47	56481	0.41	0.49	3992	0.41	0.49	7738	0.30	0.46	44750
Masters	0.66	0.47	56481	0.58	0.49	3992	0.58	0.49	7738	0.69	0.46	44750
Doctorate	0.01	0.08	56481	0.01	0.10	3992	0.01	0.09	7738	0.01	0.08	44750
Professional Certification	0.77	0.42	56481	0.99	0.09	3992	0.71	0.45	7738	0.76	0.43	44750
Beginning Certification	0.22	0.41	56481	0.01	0.09	3992	0.28	0.45	7738	0.23	0.42	44750
Professional or Beginning	0.99	0.12	56481	1.00	0.00	3992	0.99	0.12	7738	0.99	0.12	44750
Math Certification	0.08	0.27	56481	0.05	0.23	3992	0.08	0.27	7738	0.08	0.27	44750
Science Certification	0.09	0.28	56481	0.07	0.26	3992	0.08	0.27	7738	0.09	0.29	44750
Special Ed Certification	0.17	0.37	56481	0.10	0.30	3992	0.20	0.40	7738	0.17	0.37	44750
Elementary Certification	0.51	0.50	56481	0.11	0.31	3992	0.52	0.50	7738	0.54	0.50	44750
Certified through UW	0.08	0.27	56481	0.26	0.44	3992	0.09	0.28	7738	0.06	0.24	44750
Certified through WWU	0.12	0.33	56481	0.18	0.38	3992	0.09	0.29	7738	0.12	0.33	44750
Certified through WSU	0.10	0.30	56481	0.15	0.36	3992	0.08	0.28	7738	0.10	0.30	44750
Certified through UPS	0.02	0.15	56481	0.04	0.20	3992	0.03	0.17	7738	0.02	0.14	44750
Certified through SPU	0.08	0.27	56481	0.06	0.23	3992	0.05	0.22	7738	0.09	0.28	44750
Certified through SU	0.02	0.15	56481	0.03	0.16	3992	0.02	0.14	7738	0.02	0.15	44750
t_tchrfx_math_eb_ct	0.00	0.19	7921	0.00	0.21	483	-0.01	0.19	982	0.00	0.19	6456
t_tchrfx_read_eb_ct	0.00	0.14	7921	0.01	0.15	483	-0.02	0.14	982	0.00	0.14	6456
Retired	0.01	0.08	56481	0.08	0.27	3992	0.00	0.03	7738	0.00	0.02	44750
Retirement Age	61.75	3.89	16	60.09	3.59	11			0	65.40	0.55	5
Separated	0.05	0.22	56481	0.03	0.16	3992	0.03	0.18	7738	0.05	0.23	44750
Separation Age	37	11	2593	61	3	95	40	12	235	35	10	2263
Tenure	5.72	8.63	2593	37.02	3.10	95	8.44	9.49	235	4.13	5.58	2263
Deceased	0.00	0.02	56481	0.00	0.00	3992	0.00	0.03	7738	0.00	0.01	44750
DC Rate A	0.37	0.48	44964	0.30	0.48	10	0.37	0.48	219	0.37	0.48	44735
DC Rate B	0.13	0.34	44964	0.00	0.00	10	0.05	0.21	219	0.13	0.34	44735
DC Rate C	0.15	0.36	44964	0.50	0.53	10	0.16	0.36	219	0.15	0.36	44735
DC Rate D	0.13	0.34	44964	0.00	0.00	10	0.23	0.42	219	0.13	0.34	44735
DC Rate E	0.13	0.34	44964	0.00	0.00	10	0.11	0.32	219	0.13	0.34	44735
DC Rate F	0.09	0.29	44964	0.20	0.42	10	0.09	0.28	219	0.09	0.29	44735
N			56481			3992			7738			44750

Group:	Al	I Teachers			TRS 1			TRS 2			TRS 3	
_	mean	sd	count	mean	sd	count	mean	sd	count	mean	sd	count
Elementary -	0.49	0.50	54405	0.54	0.50	3786	0.53	0.50	7453	0.48	0.50	43165
Middle	0.18	0.39	54405	0.14	0.34	3786	0.16	0.37	7453	0.19	0.39	43165
High	0.27	0.45	54405	0.27	0.44	3786	0.24	0.43	7453	0.28	0.45	43165
Other	0.06	0.23	54405	0.06	0.23	3786	0.06	0.24	7453	0.06	0.23	43165
City	0.69	0.46	54421	0.68	0.47	3786	0.69	0.46	7458	0.70	0.46	43176
Town	0.13	0.33	54421	0.14	0.35	3786	0.13	0.33	7458	0.13	0.33	43176
Rural	0.18	0.38	54421	0.19	0.39	3786	0.19	0.39	7458	0.18	0.38	43176
Student Enrollment	731	486	54403	689	479	3785	683	468	7452	743	489	43165
Total FTEs	37	22	54401	34	21	3786	35	21	7453	37	22	43161
Student-Teacher Ratio	19	3	54215	19	3	3771	19	4	7418	19	3	43025
Title I	0.67	0.47	54339	0.67	0.47	3786	0.69	0.46	7439	0.66	0.47	43113
State Title I	0.71	0.46	36224	0.71	0.46	2534	0.73	0.45	5131	0.71	0.46	28559
Pct Special Education	13	6	54233	13	6	3779	13	7	7409	13	6	43044
Pct Free Reduced Meals	44	23	53265	44	23	3698	46	24	7244	44	23	42322
Pct American Indian	3	6	54337	3	6	3785	3	7	7438	3	6	43113
Pct Asian	9	9	54337	8	9	3785	9	9	7438	9	9	43113
Pct Black	6	8	54337	5	8	3785	7	9	7438	6	8	43113
Pct Hispanic	16	19	54337	16	19	3785	17	20	7438	16	19	43113
Pct White	63	23	54337	65	22	3785	62	24	7438	64	23	43113
Pct Teacher w/ Masters	66	11	54197	65	11	3775	65	11	7400	66	11	43021
Pct Pass WASL Math	0.51	0.17	53039	0.51	0.17	3659	0.50	0.17	7205	0.51	0.17	42174
Pct Pass WASL Read	0.70	0.14	53125	0.70	0.14	3674	0.69	0.14	7219	0.70	0.14	42231
Student Enrollment	13847	11107	56412	13320	11469	3987	14488	11919	7724	13784	10923	44700
Total Teachers	722	607	56421	694	625	3989	761	655	7724	717	596	44707
Pct Special Education	12	2	56407	12	2	3986	12	2	7723	12	2	44697
Pct English Language Learn	6	6	56407	6	6	3986	6	7	7723	6	7	44697
Avg Teacher Experience	12	1	56374	13	1	3981	12	1	7716	12	1	44676
Pct Teachers w/ Masters	66	6	56361	66	7	3979	66	7	7714	66	6	44667
Pct Pass WASL Math	52.67	11.51	56231	52.31	11.97	3963	51.70	11.85	7695	52.87	11.39	44572
Pct Pass WASL Read	68.25	9.59	56231	68.15	9.97	3963	67.43	10.01	7695	68.40	9.48	44572
Total Revenue per Student	\$11,851	\$15,342	56407	\$12,655	\$27,379	3986	\$12,364	\$23,229	7723	\$11,691	\$11,699	44697
Federal Revenue per Studer	\$1,385	\$3,921	56407	\$1,566	\$6,799	3986	\$1,513	\$5,767	7723	\$1,347	\$3,087	44697
Federal Title I Revenue per :	\$222	\$492	56407	\$245	\$850	3986	\$248	\$733	7723	\$215	\$385	44697
State Revenue per Student	\$6,988	\$2,711	56407	\$7,188	\$4,270	3986	\$7,101	\$3,585	7723	\$6,951	\$2,328	44697
Total Expenditures per Stude	\$11,952	\$8,396	56407	\$12,417	\$14,742	3986	\$12,289	\$12,568	7723	\$11,853	\$6,499	44697
Instruction Expenditures per	\$5,867	\$3,772	56407	\$6,095	\$6,711	3986	\$5,995	\$5,708	7723	\$5,825	\$2,881	44697
N	56481			3992			7738			44750		

Teachers' School and District Characteristics by Retirement Plan, All Teachers 2010

Group:	TRS 2, Choice			TI	RS 3, Choi	се	TR	IS 1, No Ch	oice	TRS 3, No Choice			
-	mean	sd	count	mean	sd	count	mean	sd	count	mean	sd	count	
Age, Current	49	12	7737	49	10	18641	61	3	3992	41	10	26109	
Age, Year of Hire	33	8	7737	31	7	18641	25	2	3992	34	9	26109	
Female	0.76	0.43	7737	0.70	0.46	18641	0.74	0.44	3992	0.72	0.45	26109	
Asian	0.03	0.16	7737	0.02	0.14	18641	0.02	0.15	3992	0.03	0.17	26109	
Black	0.02	0.14	7737	0.01	0.10	18641	0.01	0.12	3992	0.02	0.12	26109	
Hispanic	0.03	0.16	7737	0.02	0.15	18641	0.01	0.11	3992	0.03	0.18	26109	
American Indian	0.01	0.11	7737	0.01	0.08	18641	0.01	0.08	3992	0.01	0.09	26109	
White	0.91	0.28	7737	0.94	0.24	18641	0.95	0.23	3992	0.91	0.28	26109	
Experience	15	10	7737	18	9	18641	30	7	3992	9	5	26109	
Total Salary	\$62	\$16	7695	\$67	\$15	18559	\$70	\$15	3954	\$57	\$13	26057	
Bachelors	0.41	0.49	7737	0.29	0.46	18641	0.41	0.49	3992	0.30	0.46	26109	
Masters	0.58	0.49	7737	0.70	0.46	18641	0.58	0.49	3992	0.68	0.47	26109	
Doctorate	0.01	0.09	7737	0.01	0.07	18641	0.01	0.10	3992	0.01	0.08	26109	
Professional Certification	0.71	0.45	7737	0.83	0.37	18641	0.99	0.09	3992	0.71	0.46	26109	
Beginning Certification	0.28	0.45	7737	0.16	0.37	18641	0.01	0.09	3992	0.28	0.45	26109	
Professional or Beginning	0.99	0.12	7737	0.99	0.10	18641	1.00	0.00	3992	0.98	0.13	26109	
Math Certification	0.08	0.27	7737	0.08	0.28	18641	0.05	0.23	3992	0.08	0.27	26109	
Science Certification	0.08	0.27	7737	0.10	0.30	18641	0.07	0.26	3992	0.09	0.28	26109	
Special Ed Certification	0.20	0.40	7737	0.17	0.38	18641	0.10	0.30	3992	0.16	0.37	26109	
Elementary Certification	0.52	0.50	7737	0.46	0.50	18641	0.11	0.31	3992	0.59	0.49	26109	
Certified through UW	0.09	0.28	7737	0.10	0.29	18641	0.26	0.44	3992	0.04	0.20	26109	
Certified through WWU	0.09	0.29	7737	0.12	0.33	18641	0.18	0.38	3992	0.12	0.32	26109	
Certified through WSU	0.08	0.28	7737	0.10	0.30	18641	0.15	0.36	3992	0.10	0.31	26109	
Certified through UPS	0.03	0.17	7737	0.03	0.18	18641	0.04	0.20	3992	0.01	0.12	26109	
Certified through SPU	0.05	0.22	7737	0.05	0.22	18641	0.06	0.23	3992	0.11	0.32	26109	
Certified through SU	0.02	0.14	7737	0.02	0.14	18641	0.03	0.16	3992	0.03	0.16	26109	
t_tchrfx_math_eb_ct	-0.01	0.19	982	0.01	0.19	2506	0.00	0.21	483	0.00	0.18	3950	
t_tchrfx_read_eb_ct	-0.02	0.14	982	0.00	0.14	2506	0.01	0.15	483	0.00	0.14	3950	
Retired	0.00	0.03	7737	0.00	0.02	18641	0.08	0.27	3992	0.00	0.01	26109	
Retirement Age			0	65.25	0.50	4	60.09	3.59	11	66.00	-	1	
Separated	0.03	0.18	7737	0.09	0.29	18641	0.03	0.16	3992	0.03	0.16	26109	
Separation Age	40	12	235	34	10	1663	61	3	95	38	9	600	
Tenure	8.44	9.49	235	3.10	5.89	1663	37.02	3.10	95	6.99	3.20	600	
Deceased	0.00	0.03	7737	0.00	0.01	18641	0.00	0.00	3992	0.00	0.01	26109	
DC Rate A	0.37	0.48	218	0.30	0.46	18638	0.30	0.48	10	0.41	0.49	26097	
DC Rate B	0.05	0.21	218	0.10	0.30	18638	0.00	0.00	10	0.15	0.36	26097	
DC Rate C	0.16	0.36	218	0.16	0.37	18638	0.50	0.53	10	0.14	0.35	26097	
DC Rate D	0.23	0.42	218	0.19	0.39	18638	0.00	0.00	10	0.09	0.28	26097	
DC Rate E	0.11	0.31	218	0.15	0.36	18638	0.00	0.00	10	0.12	0.33	26097	
DC Rate F	0.09	0.28	218	0.10	0.30	18638	0.20	0.42	10	0.08	0.28	26097	
N			7737			18641			3992			26109	

Teacher Characteristics by Retirement Plan and Choice Opportunity, 2010

Group:	TR	S 2, Choice)	TF	RS 3, Choic	e	TR	51, No Cho	oice	TRS 3, No Choice			
_	mean	sd	count	mean	sd	count	mean	sd	count	mean	sd	count	
SCHOOL													
Elementary	0.53	0.50	7452	0.49	0.50	17888	0.54	0.50	3786	0.47	0.50	25277	
Middle	0.16	0.37	7452	0.18	0.39	17888	0.14	0.34	3786	0.19	0.40	25277	
High	0.24	0.43	7452	0.28	0.45	17888	0.27	0.44	3786	0.28	0.45	25277	
Other	0.06	0.24	7452	0.06	0.23	17888	0.06	0.23	3786	0.06	0.23	25277	
City	0.69	0.46	7457	0.68	0.47	17890	0.68	0.47	3786	0.71	0.45	25286	
Town	0.13	0.33	7457	0.13	0.34	17890	0.14	0.35	3786	0.12	0.32	25286	
Rural	0.19	0.39	7457	0.19	0.39	17890	0.19	0.39	3786	0.17	0.38	25286	
Student Enrollment	684	468	7451	726	487	17888	689	479	3785	755	490	25277	
Total FTEs	35	21	7452	36	21	17884	34	21	3786	38	22	25277	
Student-Teacher Ratio	19	4	7417	19	3	17825	19	3	3771	19	3	25200	
Title I	0.69	0.46	7438	0.66	0.47	17863	0.67	0.47	3786	0.67	0.47	25250	
State Title I	0.73	0.45	5130	0.69	0.46	11771	0.71	0.46	2534	0.71	0.45	16788	
Pct Special Education	13	7	7408	13	7	17812	13	6	3779	13	6	25232	
Pct Free Reduced Meals	46	24	7243	43	23	17551	44	23	3698	44	24	24771	
Pct American Indian	3	7	7437	2	5	17863	3	6	3785	3	6	25250	
Pct Asian	9	9	7437	8	8	17863	8	9	3785	9	9	25250	
Pct Black	6	9	7437	5	7	17863	5	8	3785	6	8	25250	
Pct Hispanic	17	20	7437	16	19	17863	16	19	3785	17	20	25250	
Pct White	62	24	7437	65	22	17863	65	22	3785	62	23	25250	
Pct Teacher w/ Masters	65	11	7399	66	11	17802	65	11	3775	66	11	25219	
Pct Pass WASL Math	0.50	0.17	7204	0.51	0.16	17457	0.51	0.17	3659	0.51	0.17	24717	
Pct Pass WASL Read	0.69	0.14	7218	0.70	0.13	17481	0.70	0.14	3674	0.70	0.14	24750	
Student Enrollment	14487	11919	7723	13118	10616	18621	13320	11469	3987	14259	11113	26079	
Total Teachers	761	655	7723	682	578	18623	694	625	3989	743	607	26084	
Pct Special Education	12	2	7722	12	2	18620	12	2	3986	12	2	26077	
Pct English Language Learn	6	7	7722	6	6	18620	6	6	3986	7	7	26077	
Avg Teacher Experience	12	1	7715	13	1	18614	13	1	3981	12	1	26062	
Pct Teachers w/ Masters	66	7	7713	66	6	18611	66	7	3979	66	6	26056	
Pct Pass WASL Math	51.70	11.85	7694	52.91	11.09	18568	52.31	11.97	3963	52.85	11.61	26004	
Pct Pass WASL Read	67.43	10.01	7694	68.62	9.28	18568	68.15	9.97	3963	68.25	9.62	26004	
Total Revenue per Student	\$12,364	\$23,230	7722	\$11,558	\$7,125	18620	\$12,655	\$27,379	3986	\$11,786	\$14,083	26077	
Federal Revenue per Studer	\$1,513	\$5,767	7722	\$1,317	\$2,057	18620	\$1,566	\$6,799	3986	\$1,369	\$3,649	26077	
Federal Title I Revenue per :	\$248	\$733	7722	\$210	\$260	18620	\$245	\$850	3986	\$219	\$454	26077	
State Revenue per Student	\$7,101	\$3,585	7722	\$6,968	\$2,042	18620	\$7,188	\$4,270	3986	\$6,939	\$2,513	26077	
Total Expenditures per Stude	\$12,289	\$12,568	7722	\$11,733	\$4,217	18620	\$12,417	\$14,742	3986	\$11,938	\$7,726	26077	
Instruction Expenditures per	\$5,995	\$5,708	7722	\$5,816	\$1,759	18620	\$6,095	\$6,711	3986	\$5,831	\$3,466	26077	
N			7737			18641			3992			26109	

Teachers' School and District Characteristics by Retirement Plan and Choice Opportunity, 2010

Teacher Characteristics by Retirement Plan and Choice Group

		Hired	1977-19	996, 1998	Data	Hired 2007 to Present, 2010 Data								
Group:		TRS 2			TRS 3			TRS 2			TRS 3			
-	mean	sd	count	mean	sd	count	mean	sd	count	mean	sd	count		
Age, Current -	44	10	8273	40	8	22157	36	10	2179	34	9	3141		
Age, Year of Hire	36	9	8273	31	7	22157	34	10	2179	33	9	3141		
Female	0.74	0.44	8273	0.69	0.46	22157	0.77	0.42	2179	0.74	0.44	3141		
Asian	0.03	0.16	8273	0.02	0.13	22157	0.04	0.19	2179	0.04	0.19	3141		
Black	0.03	0.16	8273	0.01	0.11	22157	0.02	0.14	2179	0.02	0.13	3141		
Hispanic	0.03	0.16	8273	0.02	0.14	22157	0.04	0.19	2179	0.05	0.21	3141		
American Indian	0.01	0.10	8273	0.01	0.09	22157	0.01	0.10	2179	0.01	0.07	3141		
White	0.91	0.28	8273	0.94	0.23	22157	0.90	0.30	2179	0.90	0.30	3141		
Experience	11	7	8273	10	6	22157	3	4	2179	3	3	3141		
Total Salary	\$39	\$10	8262	\$40	\$10	22149	\$46	\$11	2179	\$47	\$10	3139		
Bachelors	0.49	0.50	8273	0.43	0.49	22156	0.56	0.50	2179	0.53	0.50	3141		
Masters	0.49	0.50	8273	0.56	0.50	22156	0.42	0.49	2179	0.45	0.50	3141		
Doctorate	0.01	0.09	8273	0.01	0.07	22156	0.01	0.08	2179	0.01	0.07	3141		
Professional Certification	0.72	0.45	8273	0.77	0.42	22157	0.09	0.28	2179	0.08	0.26	3141		
Beginning Certification	0.27	0.44	8273	0.23	0.42	22157	0.88	0.32	2179	0.90	0.30	3141		
Professional or Beginning	0.98	0.13	8273	0.99	0.09	22157	0.97	0.17	2179	0.97	0.17	3141		
Math Certification	0.07	0.25	8273	0.08	0.27	22157	0.08	0.27	2179	0.09	0.29	3141		
Science Certification	0.09	0.29	8273	0.10	0.30	22157	0.05	0.22	2179	0.06	0.23	3141		
Special Ed Certification	0.20	0.40	8273	0.17	0.38	22157	0.13	0.34	2179	0.14	0.34	3141		
Elementary Certification	0.46	0.50	8273	0.45	0.50	22157	0.59	0.49	2179	0.54	0.50	3141		
Certified through UW	0.10	0.30	8273	0.10	0.30	22157	0.03	0.16	2179	0.04	0.18	3141		
Certified through WWU	0.08	0.27	8273	0.12	0.32	22157	0.08	0.26	2179	0.09	0.28	3141		
Certified through WSU	0.06	0.24	8273	0.09	0.28	22157	0.10	0.30	2179	0.09	0.28	3141		
Certified through UPS	0.04	0.19	8273	0.04	0.19	22157	0.01	0.10	2179	0.01	0.11	3141		
Certified through SPU	0.04	0.20	8273	0.05	0.22	22157	0.05	0.21	2179	0.05	0.22	3141		
Certified through SU	0.02	0.15	8273	0.02	0.14	22157	0.02	0.13	2179	0.03	0.17	3141		
t_tchrfx_math_eb_ct	-0.02	0.19	648	0.00	0.19	2135	0.01	0.19	283	0.03	0.20	421		
t_tchrfx_read_eb_ct	-0.02	0.14	648	0.00	0.14	2135	-0.01	0.12	283	0.01	0.14	421		
Retired	0.17	0.38	8273	0.06	0.25	22157	0.00	0.00	2179	0.00	0.00	3141		
Retire Age	65	3	612	62	3	497			0			0		
Separated	0.45	0.50	8273	0.36	0.48	22157	0.07	0.26	2179	0.49	0.50	3141		
Separation Age	54	12	2036	48	10	4329	34	10	152	32	9	1493		
Tenure	15.90	7.04	2036	16.15	6.66	4329	1.88	0.63	152	1.19	0.44	1493		
Deceased	0.02	0.15	8273	0.01	0.10	22157	0.00	0.00	2179	0.00	0.00	3141		
DC Rate A	0.36	0.48	173	0.23	0.42	5018	0.63	0.50	16	0.56	0.50	3138		
DC Rate B	0.08	0.26	173	0.11	0.31	5018	0.06	0.25	16	0.14	0.34	3138		
DC Rate C	0.16	0.36	173	0.18	0.39	5018	0.06	0.25	16	0.11	0.31	3138		
DC Rate D	0.28	0.45	173	0.31	0.46	5018	0.06	0.25	16	0.06	0.24	3138		
DC Rate E	0.08	0.27	173	0.13	0.33	5018	0.13	0.34	16	0.09	0.28	3138		
DC Rate F	0.05	0.21	173	0.04	0.21	5018	0.06	0.25	16	0.05	0.23	3138		
Ν			8273			22157			2179			3141		

Teachers' School Characteristics by Retirement Plan and Choice Group Hired 1077-1006 1008 Data Hired 2007 to Present 2010 Data

		пігец	19/7-18	90, 1998 D	ala	mileu 2007 lo Fresenii, 2010 Dala									
Group:		TRS 2			TRS 3			TRS 2			TRS 3				
-	mean	sd	count	mean	sd	count	mean	sd	count	mean	sd	count			
Elementary -	0.51	0.50	8218	0.49	0.50	22029	0.53	0.50	2118	0.49	0.50	3051			
Middle	0.19	0.39	8218	0.20	0.40	22029	0.17	0.38	2118	0.19	0.39	3051			
High	0.23	0.42	8218	0.24	0.43	22029	0.23	0.42	2118	0.27	0.45	3051			
Other	0.08	0.26	8273	0.06	0.24	22157	0.07	0.25	2118	0.05	0.22	3051			
City	0.76	0.43	8262	0.74	0.44	22135	0.68	0.47	2118	0.74	0.44	3051			
Town	0.10	0.31	8262	0.12	0.33	22135	0.12	0.33	2118	0.11	0.31	3051			
Rural	0.14	0.34	8262	0.14	0.35	22135	0.20	0.40	2118	0.15	0.36	3051			
Student Enrollment	691	414	7890	715	424	21323	686	465	2118	746	487	3051			
Total FTEs	33	19	8262	34	19	22135	35	21	2118	37	21	3049			
Student-Teacher Ratio	20	3	7875	20	3	21308	19	4	2108	19	3	3037			
Title I			0			0	0.73	0.45	2113	0.69	0.46	3047			
State Title I			0			0	0.73	0.45	1531	0.76	0.43	2114			
Pct Special Education			0			0	13	7	2107	13	6	3044			
Pct Free Reduced Meals			0			0	47	24	2067	47	25	2996			
Pct American Indian	3	7	7890	3	6	21323	3	7	2113	2	6	3047			
Pct Asian	8	8	7890	6	7	21323	9	9	2113	10	10	3047			
Pct Black	6	10	7890	4	7	21323	6	9	2113	7	9	3047			
Pct Hispanic	10	16	7890	9	14	21323	19	22	2113	20	22	3047			
Pct White	73	22	7890	78	19	21323	59	25	2113	57	25	3047			
Pct Teacher w/ Masters			0			0	64	11	2105	64	11	3039			
Pct Pass WASL Math	0	0	5674	0	0	15131	0	0	2039	0	0	2980			
Pct Pass WASL Read	0.48	0.18	5733	0.50	0.17	15189	0.68	0.15	2045	0.68	0.15	2986			
Student Enrollment	15039.24	13225.92	8270	12623.57	10882.51	22157	13573.32	10895.58	2175	15293.59	11434.79	3134			
Total Teachers	748	676	8270	620	548	22157	706	592	2175	800	626	3134			
Pct Special Education	11	1	8240	11	1	22130	12	2	2175	12	2	3134			
Pct English Language Learn			0			0	7	7	2175	8	7	3134			
Avg Teacher Experience			0			0	12	1	2170	12	1	3132			
Pct Teachers w/ Masters			0			0	66	7	2170	65	6	3130			
Pct Pass WASL Math	25	10	8188	26	9	22046	52	12	2165	52	12	3122			
Pct Pass WASL Read	45.70	11.28	8199	47.24	10.67	22066	67.22	10.10	2165	67.53	9.99	3122			
Total Revenue per Student	6705.41	942.05	8240	6609.78	892.04	22130	13162.36	36622.81	2175	11930.95	14445.09	3134			
Federal Revenue per Studer	\$396	\$320	8240	\$352	\$263	22130	\$1,722	\$8,988	2175	\$1,409	\$3,756	3134			
Federal Title I Revenue per :	\$124	\$105	8240	\$108	\$92	22130	\$275	\$1,136	2175	\$242	\$489	3134			
State Revenue per Student	\$4,470	\$711	8240	\$4,481	\$713	22130	\$7,144	\$5,201	2175	\$6,978	\$2,675	3134			
Total Expenditures per Stude	\$6,793	\$1,182	8240	\$6,734	\$1,211	22130	\$12,627	\$19,645	2175	\$12,121	\$7,901	3134			
Instruction Expenditures per	\$3,403	\$406	8240	\$3,360	\$371	22130	\$6,152	\$8,979	2175	\$5,865	\$3,517	3134			
N			8273			22157			2179			3141			

	Teacher Characteristics by DC Rate Choice																	
Group:		A			В			С		-	D			E			F	
	mean	sd	count	mean	sd	count	mean	sd	count	mean	sd	count	mean	sd	count	mean	sd	count
Age, Current	43	11	16393	40	9	5832	43	9	6766	48	10	5869	47	10	6008	50	10	4096
Age, Year of Hire	33	9	16393	30	6	5832	30	6	6766	32	8	5869	34	9	6008	37	9	4096
Female	0.70	0.46	16393	0.71	0.46	5832	0.69	0.46	6766	0.70	0.46	5869	0.73	0.44	6008	0.77	0.42	4096
Asian	0.03	0.17	16393	0.03	0.16	5832	0.02	0.15	6766	0.02	0.14	5869	0.03	0.16	6008	0.03	0.16	4096
Black	0.02	0.14	16393	0.01	0.12	5832	0.01	0.09	6766	0.01	0.10	5869	0.01	0.09	6008	0.01	0.09	4096
Hispanic	0.03	0.18	16393	0.04	0.19	5832	0.03	0.16	6766	0.03	0.16	5869	0.02	0.15	6008	0.02	0.14	4096
American Indian	0.01	0.09	16393	0.01	0.08	5832	0.01	0.09	6766	0.01	0.09	5869	0.01	0.08	6008	0.01	0.08	4096
White	0.91	0.28	16393	0.92	0.28	5832	0.93	0.25	6766	0.94	0.24	5869	0.94	0.24	6008	0.94	0.24	4096
Experience	11	8	16393	11	7	5832	13	8	6766	17	9	5869	14	8	6008	15	9	4096
Total Salary	\$58	\$15	16345	\$59	\$15	5815	\$63	\$15	6747	\$65	\$15	5845	\$63	\$15	5988	\$64	\$15	4088
Bachelors	0.34	0.47	16393	0.32	0.47	5832	0.26	0.44	6766	0.29	0.46	5869	0.26	0.44	6008	0.26	0.44	4096
Masters	0.65	0.48	16393	0.68	0.47	5832	0.73	0.44	6766	0.69	0.46	5869	0.72	0.45	6008	0.72	0.45	4096
Doctorate	0.01	0.08	16393	0.00	0.04	5832	0.00	0.06	6766	0.01	0.08	5869	0.00	0.07	6008	0.01	0.11	4096
Professional Certification	0.66	0.48	16393	0.73	0.44	5832	0.82	0.38	6766	0.87	0.34	5869	0.83	0.37	6008	0.84	0.37	4096
Beginning Certification	0.33	0.47	16393	0.26	0.44	5832	0.17	0.37	6766	0.12	0.33	5869	0.16	0.36	6008	0.14	0.35	4096
Professional or Beginning	0.98	0.14	16393	0.99	0.10	5832	0.99	0.10	6766	0.99	0.11	5869	0.99	0.12	6008	0.99	0.12	4096
Math Certification	0.08	0.28	16393	0.07	0.26	5832	0.08	0.26	6766	0.08	0.26	5869	0.08	0.27	6008	0.09	0.28	4096
Science Certification	0.09	0.28	16393	0.08	0.28	5832	0.09	0.28	6766	0.10	0.30	5869	0.09	0.29	6008	0.11	0.32	4096
Special Ed Certification	0.17	0.37	16393	0.15	0.36	5832	0.17	0.37	6766	0.17	0.37	5869	0.17	0.38	6008	0.18	0.38	4096
Elementary Certification	0.54	0.50	16393	0.55	0.50	5832	0.55	0.50	6766	0.48	0.50	5869	0.55	0.50	6008	0.54	0.50	4096
Certified through UW	0.06	0.24	16393	0.05	0.21	5832	0.06	0.23	6766	0.08	0.27	5869	0.07	0.26	6008	0.09	0.28	4096
Certified through WWU	0.11	0.31	16393	0.13	0.34	5832	0.13	0.34	6766	0.12	0.33	5869	0.13	0.33	6008	0.12	0.32	4096
Certified through WSU	0.09	0.29	16393	0.11	0.31	5832	0.12	0.32	6766	0.11	0.32	5869	0.10	0.30	6008	0.09	0.28	4096
Certified through UPS	0.02	0.14	16393	0.02	0.13	5832	0.02	0.14	6766	0.03	0.18	5869	0.02	0.15	6008	0.02	0.15	4096
Certified through SPU	0.10	0.29	16393	0.10	0.29	5832	0.08	0.27	6766	0.08	0.27	5869	0.08	0.27	6008	0.09	0.28	4096
Certified through SU	0.03	0.16	16393	0.02	0.14	5832	0.02	0.15	6766	0.02	0.14	5869	0.03	0.16	6008	0.03	0.16	4096
t tchrfx math eb ct	0.00	0.19	2333	-0.01	0.18	871	0.00	0.18	985	0.00	0.19	837	0.02	0.18	894	0.01	0.18	563
t tchrfx read eb ct	0.00	0.14	2333	-0.01	0.14	871	0.01	0.14	985	0.00	0.15	837	0.01	0.14	894	0.00	0.14	563
Retired	0.00	0.02	16393	0.00	0.00	5832	0.00	0.01	6766	0.00	0.02	5869	0.00	0.01	6008	0.00	0.02	4096
Retire Age	66	0	2			0			0	65		1			0	65	0	2
Separated	0.08	0.27	16393	0.06	0.23	5832	0.04	0.20	6766	0.03	0.17	5869	0.03	0.18	6008	0.03	0.18	4096
Separation Age	35	10	1205	32	7	316	33	8	266	35	10	163	37	10	184	40	12	131
Tenure	3.62	5.11	1205	3.66	4.66	316	5.05	6.32	266	5.31	6.35	163	5.37	7.12	184	5.34	6.53	131
Deceased	0.00	0.01	16393	0.00	0.00	5832	0.00	0.01	6766	0.00	0.02	5869	0.00	0.02	6008	0.00	0.02	4096
Ν	16393			583	2		6766	6		5869	9		6008	3		409	6	
				•			•											

	Teachers' School Characteristics by DC Rate Choice																	
Group:		Α			В			С			D			E			F	
-	mean	sd	count	mean	sd	count	mean	sd	count	mean	sd	count	mean	sd	count	mean	sd	count
Elementary	0.47	0.50	15805	0.48	0.50	5664	0.47	0.50	6538	0.47	0.50	5651	0.50	0.50	5790	0.49	0.50	3925
Middle	0.19	0.39	15805	0.19	0.39	5664	0.19	0.40	6538	0.19	0.39	5651	0.18	0.39	5790	0.19	0.39	3925
High	0.28	0.45	15805	0.28	0.45	5664	0.28	0.45	6538	0.28	0.45	5651	0.27	0.44	5790	0.27	0.44	3925
Other	0.06	0.23	15805	0.05	0.22	5664	0.05	0.23	6538	0.06	0.24	5651	0.05	0.22	5790	0.06	0.23	3925
City	0.72	0.45	15815	0.68	0.47	5665	0.68	0.47	6539	0.67	0.47	5651	0.69	0.46	5790	0.72	0.45	3925
Town	0.11	0.32	15815	0.13	0.34	5665	0.14	0.35	6539	0.14	0.35	5651	0.12	0.33	5790	0.12	0.32	3925
Rural	0.17	0.38	15815	0.19	0.39	5665	0.18	0.39	6539	0.19	0.39	5651	0.19	0.39	5790	0.17	0.37	3925
Student Enrollment	749	488	15805	749	493	5664	757	502	6538	725	486	5651	724	481	5790	734	479	3925
Total FTEs	37	22	15803	37	22	5664	38	22	6537	36	21	5650	36	21	5790	37	21	3925
Student-Teacher Ratio	19	3	15739	19	3	5651	19	3	6520	19	3	5640	19	3	5773	20	3	3908
Title I	0.66	0.47	15782	0.69	0.46	5660	0.67	0.47	6530	0.66	0.47	5646	0.66	0.48	5783	0.64	0.48	3919
State Title I	0.71	0.46	10412	0.72	0.45	3885	0.72	0.45	4398	0.69	0.46	3730	0.70	0.46	3787	0.69	0.47	2494
Pct Special Education	13	6	15768	13	6	5659	13	6	6529	13	7	5628	13	7	5764	13	8	3905
Pct Free Reduced Meals	44	24	15469	45	23	5577	44	23	6435	44	23	5549	43	23	5678	42	23	3818
Pct American Indian	3	6	15782	2	5	5660	3	6	6530	3	6	5646	3	6	5783	2	5	3919
Pct Asian	10	10	15782	8	8	5660	8	Ř	6530	8	Ř	5646	8	Ř	5783	9	9	3919
Pct Black	7	9	15782	5	7	5660	5	7	6530	5	7	5646	5	7	5783	5	8	3919
Pct Hispanic	17	20	15782	18	21	5660	16	19	6530	16	19	5646	15	18	5783	15	18	3919
Pct White	61	24	15782	63	23	5660	64	22	6530	66	22	5646	66	21	5783	65	22	3919
Pct Teacher w/ Masters	66	11	15761	66	11	5653	67	11	6527	66	11	5625	67	11	5762	67	11	3902
Pct Pass WASI Math	1	0	15465	1	0	5549	1	0	6406	1	0	5503	1	0	5632		0	3826 L
Pct Pass WASI Read	0 70	0 14	15483	0.69	0 14	5550	0 70	0 13	6417	0 70	0 13	5514	0 71	0 13	5642	0 71	0 13	3832
Student Enrollment	14967 59	11708 16	16376	12869 47	10165 71	5827	12887 65	10108 55	6754	12660 47	10352 15	5863	13442.05	10556.30	6002	14264 29	10998 40	4092
Total Teachers	782	642	16379	669	553	5827	670	550	6756	660	566	5864	697	574	6002	740	599	4093
Pct Special Education	12	2	16376	12	2	5827	12	2	6753	12	2	5862	12	2	6001	12	2	4092
Pct English Language Learn	7	7	16376	7	7	5827	6	6	6753	6	6	5862	1 6	6	6001	1 6	6	4002
Avg Teacher Experience	12	1	16368	12	1	5826	12	1	6748	13	1	5861	12	1	5998	12	1	4002
Pct Teachers w/ Masters	66	6	16366	66	6	5825	66	6	6746	66	6	5850	67	6	5996	67	6	4000
Pct Pass WASI Math	53	12	16338	52	11	5812	53	11	6733	52	11	5840	53	11	5983	54	12	4081
Pct Pass WASL Bead	68 25	0 50	16338	67 57	9.62	5812	68.18	9 1 1	6733	68 37	0.31	5840	68.98	0.23	5983	60 10	0 35	4081
Total Revenue per Student	11767.80	9810 60	16376	11/06 02	10181 23	5827	11603 01	1/201 01	6753	11505 02	3803.07	5862	11745 33	1//16 52	6001	11675.05	1271/ 10	4001
Federal Revenue per Student	\$1 358	\$2 754	16376	\$1 321	\$2 507	5827	\$1 372	\$3 753	6753	\$1 311	\$1 282	5862	\$1 3/0	\$3,653	6001	\$1 317	\$3 330	4032
Federal Title I Bevenue per 6	¢217	\$320	16376	\$221	\$362	5827	\$210	\$459	6753	\$215	\$205	5862	\$200	\$462	6001	\$203	\$415	4032
State Bevenue per Student	Ψ <u>2</u> 17 \$6.940	\$2 1/0	16376	\$6.965	\$2,007	5827	\$6.976	\$2 710	6752	\$7,000	\$1 857	5862	\$6.942	\$2 602 \$7	6001	\$6.851	¢2 340	4092
Total Exponditures per Stude	¢0,940 ¢11 079	φ <u>2,140</u> \$5.464	16376	¢0,905	Ψ <u>2</u> ,007 \$5,865	5827	¢11 772	φ <u>2</u> ,710 \$7.719	6752	¢1,000	\$3,007 \$3,010	5862	¢11 850	φ2,003 ¢7 034	6001	¢0,001	φ2,342 \$7.000	4092
Instruction Expenditures per	φ11,970 ¢5.920	\$0,404 \$0,208	16376	\$5,703	φ0,000 ¢0,573	5827	\$5,926	ψ1,110 \$2,110	6753	\$5,903	\$3,010 \$1,066	5862	\$5.946	\$7,934 \$3558	6001	¢11,011	\$2,009 \$2,100	4092
N	40,028	ψ2,390	103/0	φυ,/ 90	φ2,573	3027	φ <u></u> υ,ο <u>2</u> 0	φ3,410	0703	\$0,003	φ1,000	3002	φυ,040 6000	φ3,556	0001	4000	<i>ф</i> 3,199	4092
IN	10393			5832			0/00			5869			6008			4096		

SY	DC Rate A	DC Rate B	DC Rate C	DC Rate D	DC Rate E	DC Rate F	Ν
1996	36%	23%	30%	6%	3%	1%	536
1997	26%	13%	19%	27%	12%	4%	6389
1998	27%	14%	20%	24%	11%	5%	8043
1999	28%	14%	20%	22%	12%	5%	11612
2000	28%	14%	20%	21%	12%	5%	15332
2001	29%	15%	19%	19%	13%	6%	21255
2002	30%	14%	18%	18%	13%	6%	40000
2003	31%	14%	17%	17%	14%	8%	41152
2004	32%	14%	17%	16%	14%	8%	42789
2005	33%	14%	16%	15%	14%	9%	44621
2006	35%	13%	15%	14%	13%	9%	46194
2007	35%	13%	15%	13%	14%	9%	46285
2008	37%	13%	15%	13%	13%	9%	46493
2009	37%	13%	15%	13%	13%	9%	44964

Teacher DC Rate Choice, All Teachers in TRS 3

Teacher Retirement Plan Participation

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SY	TRS 1	TRS 2	TRS 3	Count
1996	37%	62%	1%	51018
1997	34%	56%	10%	52756
1998	31%	16%	53%	53520
1999	29%	15%	57%	54199
2000	26%	14%	61%	54585
2001	23%	13%	64%	55174
2002	21%	12%	67%	56976
2003	19%	12%	69%	57826
2004	17%	12%	71%	57725
2005	15%	11%	74%	58042
2006	13%	11%	76%	58498
2007	11%	11%	78%	58868
2008	9%	12%	78%	58918
2009	8%	14%	78%	59355
2010	7%	14%	79%	56480

Age at Retirement, All Teachers with Observed Retirement																								
TRS 1 TRS 2												TRS 3 (ALL) TRS								3 (With Choice)				
	mean	p50	sd	min	max	Ν	mean	p50	sd	min	max	Ν	mean	p50	sd	min	max	Ν	mean	p50	min	max	sd	Ν
1996	58.2	58	4.3	43	72	704	62.9	65.5	4.1	55	67	12												
1997	58.0	58	4.3	45	79	899	65.7	65.5	3.8	58	73	14	64.0	64		64	64	1	57.3	57	56	59	1.53	3
1998	57.7	57	4.3	45	79	923	64.1	65	3.2	58	70	19	59.3	58	4.0	56	65	4	58.8	59	56	61	1.9	5
1999	57.3	57	4.0	44	70	993	65.2	66	3.5	57	71	20	60.5	59.5	4.5	56	69	6	60.9	61.5	55	67	3.7	14
2000	57.7	57	4.0	45	75	981	64.4	65	3.3	56	74	35	60.9	61.5	3.7	55	67	14	59.4	59.5	55	64	2.8	20
2001	57.8	57	3.9	50	74	964	64.3	65	2.8	57	70	43	59.4	59.5	2.8	55	64	24	60.7	62	55	66	3.5	28
2002	58.0	57	4.0	47	76	905	66.6	66	3.0	60	73	25	60.9	62	3.7	55	68	29	60.7	60	55	66	3.1	27
2003	58.3	57	4.3	49	75	980	63.3	65	3.9	56	71	31	60.8	60	3.2	55	66	33	61.4	61	55	71	3.9	49
2004	58.7	58	4.1	33	76	1056	64.9	65	3.6	55	76	57	61.5	61.5	3.8	55	71	58	61.9	63	55	69	3.4	51
2005	59.2	59	4.0	51	78	1032	65.0	65	2.6	58	77	84	62.0	63	3.5	55	69	59	62.3	62	55	72	3.5	83
2006	59.5	60	4.0	51	78	964	64.3	65	3.3	56	72	86	62.4	63	3.6	55	72	99	63.3	64	56	73	3.1	79
2007	60.0	60	4.0	52	75	1055	65.1	65	3.4	56	77	84	63.5	64	3.1	56	73	101	63.6	65	55	73	3.2	92
2008	60.9	61	4.0	53	83	829	65.3	65	2.5	56	74	84	64.0	65	3.3	55	75	121	63.2	64	56	71	3.0	73
2009	61.3	61	3.8	54	78	730	64.9	65	3.2	55	73	77	63.8	65	3.5	55	73	100	65.3	65	65	66	0.6	3
Total	58.7	58	4.23	33	83	13019	64.8	65	3.2	55	77	671	62.7	63	3.6	55	75	653	62.3	63	55	73	3.5	527

Appendix E: Letters to Teachers Regarding TRS3 Transfer Payments

STATE OF WASHINGTON DEPARTMENT OF RETIREMENT SYSTEMS PO BOX 48380 OLYMPIA, WASHINGTON 98504-8380

April 15, 1996

SAMPLE DEPARTMENT 02

TRS Plan 2 SSN

Subject: 20% Bonus for Transferring to TRS Plan 3

As a member of the Teachers' Retirement System (TRS) Plan 2 you are eligible to transfer to TRS Plan 3 beginning July 1, 1996. You must continue to be employed in an eligible TRS Plan 2 position at the time of transfer. If you transfer into TRS Plan 3 between July 1, 1996 and January 1, 1998 and establish service credit for January 1998, a bonus of 20% of your January 1, 1996 account balance will be added to your account.

To assist you in making the decision to transfer into TRS Plan 3, or to remain in TRS Plan 2, the Department of Retirement Systems (DRS) is providing you with your estimated January 1, 1996 account balance.

Your estimated account balance is \$ 3,298.67.

This balance could change between now and January 1, 1998, if your employer submits changes to your contributions for the year 1995 or earlier.

We will be distributing the third issue of the *TRS Plan 3: a newsletter for TRS Plan 2 members* to your employer in late April. It will contain additional information about transferring to Plan 3. Be sure to ask your employer for a copy. Also, please keep this letter so that you will have your estimated account balance when deciding whether to transfer to Plan 3.

If after reading the newsletter you have additional questions about Plan 3, call the TRS Plan 3 Information Line at (360) 664-4298. TRS Plan 3 member information is also available on the Internet at http://www.wa.gov/DRS/drs.html.

Sincerely,

unel Hazel

Janet Hazelton Administrative Manager

SAMPLE DEPARTMENT 02

STATE OF WASHINGTON DEPARTMENT OF RETIREMENT SYSTEMS P.O. Box 48380 * Olympia, Washington 98504-8380 * (360) 709-4700

May 20, 1997

NAME ADDRESS CITY STATE ZIPCODE

TRS Plan 3

SUBJECT: New developments in TRS Plan 3

Our records indicate you are a member of the Teachers' Retirement System (TRS) Plan 3 who transferred from TRS Plan 2. The Department of Retirement Systems (DRS) is sending you this letter regarding recent TRS Plan 3 developments.

Transfer Payment Increased to 40 Percent. Governor Locke signed the bill increasing the transfer payment from 20 to 40 percent. Because you have already transferred to TRS Plan 3, you need only establish service credit for January 1998, to be eligible for the 40 percent transfer payment. If eligible, your account will be credited with a transfer payment equal to 40 percent of your January 1, 1996, account balance. This legislative change was made because recent actuarial data indicated that the larger transfer payment was required to maintain the neutral fiscal impact that Plan 3 legislation was intended to have.

Estimated Account Balance Updated. Since the percentage used to calculate the transfer payment has increased significantly, we are providing an updated estimate of your January 1, 1996, account balance. This estimate may be different than previous estimates you may have received because it reflects our most current information and a correction in the interest calculation. Additionally, the balance could change in the future based on a DRS review or changes submitted by your employer.

Your January 1, 1996, estimated account balance :\$ 21,319.59Your estimated 40 percent transfer payment:\$ 8,527.83(based on the above account balance)\$ 8,527.83

Investment Education Begins. You should have recently received an announcement of the TRS Plan 3 investment education program. For publications and seminars about the principles of retirement investing and TRS Plan 3 investments, contact ICMA Retirement Corporation (RC) at 1-888-711-TRS3.

Nashington State Legislature

The Joint Committee on Pension Policy

SENATORS Jeanine Long, Vice-Chair Al Bauer Rosa Franklin Karen Fraser Ken Jacobsen Parn Roach Dino Rossi Shirley Winsley

REPRESENTATIVES Don Carlson, Chair Steve Conway Kathy Lambert Val Ogden Barry Sehlin Duane Sommers Helen Sommers Cathy Wolfe

Nov. 20, 1997

RE: Increase in bonus for switching from TRS 2 to TRS 3

Dear TRS 2 member,

On behalf of the Joint Committee on Pension Policy (JCPP), we would like to advise you of some important news if you are considering a transfer from the Teachers' Retirement System Plan 2 to the Teachers' Retirement System Plan 3. This letter is to inform you of two proposals being considered by the JCPP that would enhance benefits in the TRS 3 system. To become law, these proposals must be approved by the state Legislature.

The first JCPP proposal would provide an additional payment to a TRS 3 member's defined contribution account. The JCPP-proposed payment may be as high as 65 percent of their employee contributions. TRS 2 members who choose to transfer to TRS 3 by the Dec. 31. 1997. deadline would receive this total potential payment of 65 percent of their employee contributions rather than the 40 percent currently specified in state law. (The 40 percent amount was approved by the state Legislature during the 1997 session.)

The deadline to transfer from TRS 2 to TRS 3 is approaching quickly, so if you're thinking about making this transfer, you'll need to decide soon. You must make the transfer to TRS 3 by Dec. 31, 1997, if you want to be eligible for the potential increase in the <u>additional payment</u>.

The other proposal being considered by the JCPP could bring even more good news for TRS 3 members. It would allow TRS 3 members to share in extraordinary investment gains made by the State Investment Board. When investment earnings on the pension funds average more than 10 percent during a previous four-year period, TRS 3 members would receive a portion of these gains through a payment to their defined contribution account. The gain-sharing payment would be calculated and paid once each biennium. The proposal would provide members with about \$150 per year of service credit for the 1997-99 biennium. The gain-sharing benefit would be offered to all members of TRS 3, regardless of when they transfer from TRS 2.

Please note that these proposals must be passed by the 1998 Legislature and signed into law by the governor for them to go into effect.

If you have questions about TRS Plan 3 or other benefits for retired teachers, contact the state Department of Retirement Systems at (360) 709-4700 or the TRS Plan 3 Information Line at (360) 664-4298. Or visit its web site at <u>http://www.wa.gov/DRS/drs.html</u>.

Sincerely,

alen DON CARLSON

Chair, Joint Committee on Pension Policy

Mail Stop: 40914 FAX: (360) 586-8135 Office of the State Actuary 2420 Bristol Court S.W., Suite 101 P.O. Box 40914 Olympia, WA 98504-0914

TDD: 1-800-635-9993 (360) 753-9144