Worker Exits from State and Local Government Jobs:
The Role of Pensions in Explaining Life Cycle Patterns

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I. Introduction

State and local government jobs comprise roughly 12% of the work force.[1] Attention to the state
and local job sector has jumped in the last few years, as contentious political battles have been
fought about budget cuts, collective bargaining rights, and pension funding at the state and local
level. One point of view expressed during these debates is that state and local government
(S&LG) workers have gotten a better deal than private-sector workers, being sheltered from
business cycles and enjoying generous fringe benefits, including pensions and health insurance.[2]
A counter-response is that S&LG workers have simply been willing to exchange cash pay for
fringe benefits without getting more total compensation. While comparisons across sectors is not
a trivial exercise, recent studies suggest that less educated workers earn more in total
compensation from S&LG jobs, controlling for other observable differences between them,
while more educated workers earn less (Munnell et al 2011, Heywood and Bender 2010, Keefe
2010).[3]

One possible source of divergence underlying this comparison is that workers who take S&LG
jobs may be precisely those who anticipate not changing jobs and thus benefit the most from the
stability and delayed compensation that are typical of S&LG jobs.[4] Yet, the way that delayed
compensation, especially in the form of defined benefit (DB) pensions, is structured may induce

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[1] Among individuals with jobs in the March 2011 Current Population survey, 12.5% reported being in state and local
government for their main job (with local government jobs comprising a little over 60% of that total), compared to
74.2% in private-sector for-profit and not-for-profit jobs, 2.6% in federal government jobs, and 10.6% in self-
employment (computed using final weights). Five years earlier, in March 2006, 11.9% were in state and local
government jobs.

[2] Keefe (2010) culled several quotations by state governors. For example, Governor Chris Christie of New Jersey
said, " [There are] two classes of people in New Jersey: public employees who receive rich benefits, and those who
pay for them." (Address to the New Jersey Conference of Mayors at the Annual Luncheon Meeting in Atlantic City.
Transcript, http://njcm.org/Conference2010.)

[3] The comparisons are difficult because total compensation is not measured well in data sets like the Census and
Current Population Survey that include controls for differences among workers, while worker and job characteristics
are not measured well in data sets like the National Compensation Survey that reports detailed data on forms of
compensation.

[4] Moreover, employers that offer such job characteristics may gain the most in worker productivity from the types of
workers who sort into such jobs; see Friedberg (2011) for a review of these arguments.

a reversal of this pattern at older ages. Almost all S&LG jobs offer DB pensions, and these pensions offer incentives to stay in a job until a certain age and then to exit abruptly, sometimes as early as age 50 and often by age 60. This pension structure used to be common in private-sector jobs as well but has mostly disappeared in the last 30 years, being replaced with defined contribution (DC) pensions like 401(k) plans that offer smooth accruals and no particular incentives to retire at any age.[5] The shift in pension plan structure in private-sector jobs has led to significant delays in retirement (Friedberg and Webb 2005), perhaps helping to explain the overall increase in retirement ages in recent years (Munnell 2011, Friedberg 2007).

We would thus expect to see lower exit rates at most ages when comparing workers in S&LG jobs to workers in private-sector jobs, but a reversal of this pattern at older ages, especially in recent years as pension structure has remained static in S&LG jobs while shifting dramatically in private-sector jobs. However, patterns in job transitions over the life cycle have not been examined systematically in previous research. In this paper I analyze data on job exits across sectors over time. I further consider how these typical life-cycle patterns have been affected by business cycles. The Great Recession has led to massive job losses, even affecting jobs in state and local government and jobs held by older workers, which have typically been shielded in past recessions.

Data limitations make it difficult to observe life-cycle mobility patterns across sectors and over time. Most of our longitudinal surveys, which can track job transitions well, have relatively small samples, and thus small numbers of S&LG workers, and focus on a limited number of cohorts, making comparisons over time difficult. Most of our large surveys are cross-sectional and report current job status well, the structure of compensation in the current job less well, and job transitions quite poorly. To make some progress, I use questions about the sector of one's current job and of the main job held last year, asked of a large cross-section of individuals in the March Current Population Survey (CPS). This enables me to analyze long-term patterns in job exits from the private and the state-and-local sectors at different ages. Yet, it still delivers a limited picture. I can only observe exits from sectors and not exits from jobs within a sector. This understates job-to-job mobility but still gives a complete picture of retirement. Bear in mind, too, that it understates job-to-job mobility much more in the private sector than in the S&LG sector, for reasons I discuss later. Second, I am not able to link individuals to information about their pension structure, even in the S&LG sector where pension plan information is publicly available, because I do not know their years of experience in their current job.

I examine exit rates from different job sectors from 1993-94 to 2010-11. I find the following patterns. (1) Interestingly, average exit rates for workers of all ages are similar from the private sector and the S&LG sector. (2) The age patterns in exit rates differ, however. Exit rates from job sectors follow a U shape over the life cycle, but the U shape is more pronounced for S&LG workers than for private-sector workers. Before the Great Recession, S&LG workers generally had lower exit rates in their 40s and early 50s, but they had higher exit rates when young and old. (3) Before the Great Recession, exit rates of middle and older workers in the private sector declined steadily, while exit rates at the same ages in the S&LG sector declined less, especially at middle ages. (4) During the Great Recession, all ages except older workers in the private

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[5] Moreover, the DB plans that remain in the private sector have adopted features of contributory accounts, such as steady accruals in cash balance plans and lump-sum payouts.

sector experienced increases in their exit rates, while only middle-aged workers in the S&LG sector experienced increases.

These patterns suggest a possible role for DB pensions in explaining differences in job stability at middle and older ages across sector. These factors further indicate how the S&LG workforce may be affected as governments have begun to change their pension structure. Many state governments, facing extraordinary pressure to bolster pension funding, have changed DB plan parameters in the last few years to reduce pension accumulations by workers and, in doing so, to delay them as well. Moreover, a substantial number of states have also begun to discuss shifting from DB to DC pensions. While most of these discussions have focused on funding issues, these reforms can also affect the S&LG workforce, leading to more exits of middle-aged workers and fewer exits of older workers and in turn affecting payroll and health insurance costs.

II. Background on Pensions and Job Mobility

The retirement pensions available to most workers have shifted drastically over the last thirty years – for everyone but state and local government employees. Most private-sector employers, along with the federal government, have stopped offering DB pensions, especially for new employees, replacing them with DC pensions instead. Many of the DB plans that remain in the private sector have adopted features of contributory accounts, such as steady accruals in cash balance plans and lump-sum payouts. Among full-time employees with a pension, 69% had a DB plan and 45% had a DC plan in 1983 (with some workers having both types). In 2001, only 39% had a DB plan, and a full 80% had a DC plan (Friedberg and Owyang 2005). In contrast, traditional defined benefit pension plans remain the overwhelming norm for teachers, policemen, and other employees of state and local governments. Among workers with pension coverage, DB plans covered 98% of all public sector employees in 1975, compared to 92% in 2005 (Munnell et al 2007).[6]

The structure of DB pensions has major implications for the staffing of S&LG jobs. Typically, the incentives for workers with DB plans to stay in their jobs shift dramatically over the course of their careers. For example, many government workers receive minimal pension benefits if they leave their jobs before the age of 45-50, then large gains for staying a few more years, after which their pension wealth begins to drain away if they do not retire. Moreover, vesting requirements associated with DB plans and limited transferability across states and between public and private jobs impede mobility in the labor market. Next, I will review these features in more detail, and after I will summarize the literature on pension structure and job mobility; for more information, see Friedberg (2011).

A. DB and DC Pension Structure

DB pensions typically pay retired workers an income flow until death. Denote the annuity paid out each year after retirement in year t as b_t, b_{t+1}, b_{t+2}, … . This benefit flow can be assigned a cash value B_t that represents discounted expected future benefits if the worker retires in year t:

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[6] Among workers with pension coverage, DB plans covered 98% of all public sector employees in 1975, compared to 92% in 2005 (Munnell et al 2007). The largest category of state and local government workers with DC plans are university faculty.

$$B_t^{DB} = E\left[\sum_{j=0}^{\tilde{T}} \frac{b_{t+j}}{(1+\tilde{r}_{t+j})^j}\right] \approx \sum_{j=0}^{\bar{T}} \frac{\pi_{t+j}b_{t+j}}{(1+r_{t+j})^j} = b_t + \frac{\pi_{t+1}b_{t+1}}{1+r_{t+1}} + \frac{\pi_{t+2}b_{t+2}}{(1+r_{t+2})^2} + \dots \quad .$$

Uncertainty arises from several sources, including the unknown date $\tilde{T}$ of death, occurring with probability $1\text{-}\pi_{t+j}$ in period $t+j$, conditional on having reached $t+j\text{-}1$; and the uncertain future interest rate $\tilde{r}$.[7]

Pension wealth B_t can be viewed as the value of leaving one's job today and claiming the resulting pension benefits. A worker who is deciding whether to retire this year or not should also consider the value of waiting to claim benefits at a future retirement date. The gain from waiting for one year can be defined in terms of *pension wealth accrual ΔB_{t+1}*:

$$\Delta B_{t+1} = \frac{1}{1+r} B_{t+1} - B_t \quad .$$

In fact, the gain to waiting to retire often involves nonlinearly because workers accrue rights to future benefits in a complicated fashion as they gain career earnings, job tenure, and age. To see this in a snapshot, Figure 1-A shows pension wealth B_t^{DB} in the Teacher Retirement System (TRS) of Texas, and Figure 2-A shows a typical DB plan and, by contrast, a typical DC plan, both from the private sector and observed in the Health and Retirement Study (Friedberg and Webb 2005).[8] Figures 1-B and 2-B, in turn, show pension wealth accrual ΔB_{t+1} in the same plans.

As people work longer in a job offering a DB pension, DB pension wealth rises, but in a starkly nonlinear fashion, with occasional jumps upward and, in many cases, a late drop-off. There are often between one and three crucial dates when the path of DB pension accrual spikes upward, for example with one very large spike in Figure 1-B (and two small ones) and twice in Figure 2-B, and most plans show later losses in pension wealth.

The first jump occurs at the vesting date, when a worker first qualifies for future benefits. The plan in Figure 2-A vests after a worker spends ten years on the job, after which she begins to accrue a claim to future benefits – though she does not yet qualify for an immediate benefit upon leaving the job. Pension wealth in 2-A leaves the horizontal axis upon vesting and jumps up to a value of almost $60,000.

The other spike in Figures 1-B and 2-B occurs when someone reaches full years of service at the plan's *normal retirement age* (NRA). In the TRS of Texas, the NRA is either age 65 with 5 year of service or follows a "rule of 80", where age and years of service (for five or more years of service) must at least equal 80. If a worker retires at the NRA, then her DB plan will start to pay

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[7] Other sources of uncertainty include the future inflation rate, as many S&LG plans do not automatically adjust for inflation; and political uncertainty over the likelihood of receiving future benefit payments.

[8] The plans in Figure 2 have been slightly altered, as described in Friedberg and Webb (2005), to protect confidentiality.

out benefits immediately. The initial benefit b_t at the NRA is typically a proportion of the worker's recent salary, with the proportion increasing in tenure.

Retiring before the NRA often reduces pension wealth for a few reasons. Many plans have an "early retirement age" (ERA); upon reaching that age, one can immediately receive benefits, but they will be reduced from the value in the formula above. Plans with an ERA exhibit a middle spike between vesting and the NRA. In the TRS of Texas, retiring at the ERA of age 55 with 5 years of service or at any age with 30 years of service reduces annual benefits according to an actuarial formula; in other states, the reduction rate varies between 3% and 6% for each year before the NRA. Whether or not a plan offers early retirement, retiring before the NRA erodes pension wealth because fewer service credits are accumulated (so α_t is smaller) and because final average salary is not adjusted for inflationary gains after retirement and before benefits begin (so $\overline{Y}_t$ is smaller, whereas staying in the job would yield those gains). These factors account for the gradual increase in pension wealth after the vesting date in Figures 1 and 2.

Lastly, retiring after the NRA reduces the number of years that full benefits are received and hence reduces the present value of benefits at retirement – one gives up current pension benefits income without replacing them later on, as benefits cease upon death. This accounts for the decline in pension wealth after the NRA.

All of this stands in sharp contrast to the path of pension wealth accrual in DB plans to DC plans, like 401(k) accounts. An annual contribution is made to a retirement account and that account belongs to the worker whenever she leaves her job, possibly after a vesting period for employer contributions. The funds grow at the rate of return $\tilde{r}$. Pension wealth after vesting is simply

$$B_t^{DC} = B_{t-1}^{DC}(1 + \tilde{r}_t) + c_t^{DC},$$

the amount of accumulated funds plus this period's contribution c_t.[9] Pension wealth accrual is therefore constant if there is no change in the rate of return or in the contribution rate, as is assumed in Figure 2. The smooth path of DC pension wealth accrual is starkly different from to the bumpy path of typical DB accruals.

B. The Literature on Pension Structure and Job Mobility

As Friedberg (2010, 2011) made clear, we know a great deal about the impact of pension structure on retirement in the private sector and an increasing amount about the impact of pension structure in the public sector, but little about the impact of pension structure on job mobility at younger ages.

Private-sector pensions and retirement. The literature emphasizes show the substantive role that DB pensions play in influencing retirement ages in private-sector jobs – historically having as important a role as Social Security. Early evidence about retirement effects originated in studies of employer plans (Kotlikoff and Wise 1985, 1987, 1989, Stock and Wise 1990a, 1990b,

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[9] Contributions are tax-deductible (as are a firm's contributions to fund a DB pension), and returns accumulate tax-free. Withdrawals from DC pensions, like DB pension benefits, are taxable. Thus, the tax treatment of DB and DC plans is equivalent.

Lumsdaine, Stock and Wise 1992). The spikes and dips highlighted in Figures 1-2 were, if anything, more extreme in many of these plans. Stock and Wise (1990a) found that most workers in their sample from a Fortune 500 firm retired before age 62, when Social Security benefits first become available, due largely to the plan's early retirement age of 55. Stock and Wise also made important contributions in their empirical modeling of the effect of pensions, and simulations of their model made the important point that an increase in the ERA would lead to an increase in the average retirement age, while at the same time leading to an increase in the share of workers exiting at substantially earlier ages, as the delay would eliminate the advantage of waiting to retire for some.

A later set of papers took advantage of national survey data in order to gain a representative sample of the entire work force. Samwick (1998) used the 1983-1989 Survey of Consumer Finances (SCF) and both Coile and Gruber (2007) and Friedberg and Webb (2005) used the Health and Retirement Study (HRS). These surveys are unusual in obtaining information about pension characteristics directly from employers. This is critical because, as Gustman and Steinmeier (1999) show, individuals make frequent and substantive mistakes in reporting the intricate plan characteristics of their own pensions. Also, keep this in mind as a limitation to my analysis, as the CPS reports extremely limited information on current pension coverage, while my analysis comparing workers across sectors requires relatively large samples of multiple cohorts and is not feasible in the SCF nor HRS.

Samwick's estimates suggest that extending a DB pension coverage using a representative plan to all workers in the SCF would raise the probability of retirement between ages 50-70 by 4.9%. As this corresponds to roughly the increase in DB coverage observed in the postwar period, it suggests further that DB pensions account for over a quarter of the total decline in the average U.S. retirement age. Coile and Gruber focused largely on the role of Social Security but confirmed Samwick's results that DB pension structure continues to affect retirement ages in the more recent years covered by the HRS. Friedberg and Webb focused directly on the shift in private pension structure from DB to DC which was already underway among the early waves of the HRS. Their estimates indicated that the ongoing shift in pension structure is projected to raise the median retirement age of full-time employees with a pension by about ten months when comparing cohorts aged 53-57 in 1983 and in 2015.

State and local pensions and retirement. Recently, researchers have begun to acquire administrative data that allows them to apply the tools developed in the earlier literature to study state and local government pensions. The focus of this research has been on public school teachers, the largest single occupation within the S&LG sector and of independent interest in understanding how the structure of compensation shapes the education production function.

Some papers on teachers focused on specific changes in pension structure within a state, and some estimated structural retirement models for all teachers in a state. Ferguson, Strauss, and Vogt (2006) used Pennsylvania teacher records to study a temporary retirement incentive program. The authors estimated that the substitution elasticity of retirement is significant and quite negative, so that retirement responses were substantial. Brown (2009), on the other hand, estimated a somewhat inelastic response to a major benefit expansion in California, possibly because teachers responded gradually to the suddenly announced change. Costrell and McGee

(2010) estimated a retirement model for Arkansas teachers. In simulations based on those estimates, they showed that eliminating the early retirement provision, currently available at 25 years of service, would lead some teachers to work until full retirement at 28 or 30 years but would lead others to retire earlier. Ni and Podgursky (2010) undertook a similar effort for Missouri teachers.

Pensions and job mobility at younger ages. While retirement timing is strongly influenced by the timing of peaks in DB pension wealth accumulation, at younger ages, we might see the converse relationship – workers should have a lower propensity to exit jobs with DB pensions so that they can gain access to these future peaks. The present value of those future peaks is relatively small early in a career (Gustman and Steinmeier 1993) and then grows substantially with additional tenure (Allen, Clark, and McDermed 1988). Thus, mobility should be increasingly inhibited as tenure rises.

Friedberg (2011) emphasizes the identification problem associated with distinguishing mobility disincentives that increase with tenure (where the decision to stay in a job may reflect preferences for stability as well as outside incentives) and that differ across types of jobs (where the choice of what job to take may also respond to preferences for stability). The retirement literature skirts this problem by exploiting the sharp discontinuities in DB pension formulas that appear in Figures 1 and 2, based on the assumption that they are somewhat arbitrary functions of earnings, age, and tenure, and not influential in the job entry decision many years earlier. Given the more troublesome identification problem in studying job mobility at earlier ages, existing studies are suggestive but not definitive.

The spread of DC pensions has offered an opportunity to compare mobility of workers with DB and DC plans. Such workers are somewhat similar in other observable characteristics, and more so than are workers with and without pensions at all. This type of comparison underlies the strategies in Gustman and Steinmeier (1993) and Friedberg and Owyang (2005). Gustman and Steinmeier focused on job changes between 1984 and 1985 in the Survey of Income and Program Participation. Friedberg and Owyang used data on job tenure from the 1983-2001 releases of the SCF and the 1993 pension supplement of the CPS. This data, coming from a later time period and includes more variation in pension structure, which may account for differences in findings. Gustman and Steinmeier found similar mobility rates for workers with DB and DC pensions, while Friedberg and Owyang found that workers with DB pensions have significantly longer job tenure, as measured by both current tenure and expected future tenure, than do workers without pensions and workers with DC pensions. Workers with a DB pension have total expected tenure that is 5.0-7.0 years longer on average than workers without a pension, while workers with a DC pension have total expected tenure that is 2.5-4.0 years longer, with very similar findings in the CPS.

To sum up, the evidence that DB pensions deter worker mobility at younger ages is less definitive than evidence about their influence on the timing of retirement. It is because of the lack of concrete information about the effects of pensions on mobility at younger ages that it is useful to consider other approaches, as I take here.

III. Data

The Current Population Survey. As I noted earlier, data limitations make it difficult to observe life-cycle mobility patterns across sectors and over time. Longitudinal surveys can track job transitions well and often report detailed information about the structure of compensation associated with the sequence of jobs that individuals take. Yet, they have relatively small samples, and thus small numbers of S&LG workers, and most focus on a limited number of cohorts, making comparisons over time difficult.[10] Most of the surveys with large sample sizes are cross-sectional, like the CPS and the Census, but they have more limited information, especially about non-wage fringe benefits and about job transitions.

To make some progress, I exploit the retrospective information available in the March CPS. Along with the usual questions about current work status that are asked every month in the CPS, the March CPS asks about income and work status in the previous year. It asks about the industry, occupation, and class of the main job held currently and the longest job held last year. Class of job consists of private for-profit, private not-for-profit, federal government, state government, local government, unincorporated self-employed, and incorporated self-employed.

Using the March CPS in this way enables me to analyze life-cycle patterns in job exits from the private versus the state-and-local sectors and how those have changed over time. Yet, it still delivers a limited picture. First, I can only observe exits from sectors and not exits from jobs within a sector. This understates job-to-job mobility but still gives a complete picture of retirement. Also, it understates job-to-job mobility much more in the private sector than in the S&LG sector, in all likelihood. Movements across S&LG jobs are constrained by geography – a similar job working for a different S&LG employer may not be available locally. As well, because most public pension systems are run at the state level, transitions across local government employers are usually irrelevant when evaluating the role of DB pensions in affecting job transitions; moreover, transitions across some state government employers may be irrelevant when buy-in and transfer provisions are available to transfer service credits across systems.

A second limitation of the CPS is that I cannot link individuals to much information about their pension structure. The March CPS reports whether someone was covered by a pension plan in their job last year but not whether they are covered in their current job, and also it does not currently ask what type of pension the job offers. For S&LG workers, one can determine with some accuracy what pension plan one participates in using information on occupation and residential location, though some individuals do not work in the same jurisdiction they live in. However, one cannot determine a particular individual's pension accruals without knowing their years of experience in the current job.[11]

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[10] While the Panel Study of Income Dynamics replenishes its sample by tracking the descendants of original respondents, it has relatively poor information about pension structure. The Health and Retirement Study also adds new cohorts at intervals but does not report detailed information about job transitions and fringe benefits in earlier jobs at ages before 51, when new respondents enter the HRS.
[11] It may be possible to use information on age to make a guess at, say, the timing of maximum pension accruals in some S&LG plans where age is a key determinant of the plan Early and Normal Retirement Ages but years of experience is not.

Sample characteristics. I define my sample from the CPS as follows. I eliminate anyone who was in the military last year or this year. I eliminate a small number of cases (roughly a hundred each year) who report not working but are listed as in particular job class or report working but are not listed as in a particular job class. I eliminate everyone who did not have a job either last year or currently, and lastly I eliminate people under the age of 18 or over the age of 75. Note that the criteria that people must have had a job either last year or currently leads to an imbalance, with a much higher percentage not having a job currently (9.9%) than not having a job at any time last year (1.9%).[12]

Class of job as reported in the CPS consists of private for-profit, private not-for-profit, federal government, state government, local government, unincorporated self-employed, and incorporated self-employed. Because most public pension systems are run at the state level, I combine the state government and local government classes in my analysis.[13] I also combine the for-profit and not-for-profit jobs in the private sector, as well as the unincorporated and incorporated jobs in the self-employed sector. This results in five categories: private, state/ local government, federal government, self-employed, and not working.

I use data covering job flows in 1993-94 to 2010-11 and report sample statistics in Table 1. After applying the sample selection criteria, I have a sample size of 1,600,824, consisting of 52.6% males and with an average age of 39.5. 32.2% of the sample has completed high school, 29.1% have attended college, and 26.9% have graduated from college. Interestingly, the S&LG sector, highlighted in column (3), is substantially more female (59.7%), older (42.4), and more educated (47.7% college graduates).

IV. Results

In this section I report statistics on job exits from the private and the state-and-local sectors by age. I am interested in determining whether people in S&LG jobs have lower exit rates at prime ages and higher exit rates at older ages, compared to people in private sector jobs. I further analyze these life cycle job exits over time, both to determine the possible role of declining DB pension coverage in the private sector and to examine the role of the Great Recession in affecting job exits.

Average exit rates. Table 1 shows people's current and last year's job sector, conditional on working for pay. Averaged over the entire time period for workers aged 18-75, about 75% of the sample work in the private sector, about 12% in S&LG, about 2.5% in the federal government, and about 10% in self-employment.

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[12] Among people who had a job in one period but not the other, usual weekly hours are substantially lower, so part-time work in one period indicates a weaker attachment to the labor force overall. The people who had a job last year but not currently are disproportionately female among those who are prime-age (between ages 25-54) and, among the males, are disproportionately younger (<age 25) or older (>age54).

[13] The major exception are teachers union operated by some big cities, notably New York City, Chicago, Boston, and Kansas City and St. Louis in Missouri; and university professors, who have separate pension systems, most often DC, in many states. Besides that, local governments infrequently operate their own pension systems; in Virginia, for example, a small number of cities (like Charlottesville) operate their own pension system for non-teacher local employees.

The average flows out of sectors are of particular interest, and here we see that average job flows are *generally similar* out of the private sector and the S&LG sector – not lower, as hypothesized for the S&LG sector. Columns (4) and (5) limit the sample to whether individuals were in the private sector or the S&LG sector, respectively, for their main job last year. Among those who were in the private sector last year, 13.7% had left as of March of the current year, with 11.1% not working currently, 1.3% going to the S&LG sector, 1.0% to self-employment, and 0.2% to the federal government. Among those who were in an S&LG job, in comparison, 15.8% had left as of March – a *higher* exit flow than out of the private sector – with 7.52% not working, 7.46% moving to the private sector, and 0.40% moving to the federal government, and 0.42% moving into self-employment.

The finding that average exit rates are the same or higher in the S&LG sector is somewhat surprising, so we now turn to the life cycle analysis to see how these patterns vary by age.

Exit rates by age, 1993-94. Figure 3-A shows exit rates out of each sector for ages 30-65 in 1993-94, the first year of my sample. As the series are quite jagged, the figures show smoothed series, first across ages (using two adjacent cells on either side) and then across years (using one adjacent cell on either side).[14]

Annual exit rates in 1993-94 are generally U-shaped, starting out high at young ages (in the 12-14% range), then declining into early middle age (reaching a level of 5-10%), and then rising after that (passing 15% around age 55 and 20% around age 60). The decline early in the life cycle bottoms out at roughly age 40 in most sectors *but continues declining until the late 40s* in the S&LG sector – this later trough for the S&LG sector is noteworthy as it may indicate that people stay longer at those ages as they near the large gains available in pension wealth if they wait until their plans' Early or Normal Retirement Ages. Exit rates then climb a little faster in the S&LG sector, exceeding exit rates from the private sector at all ages by at least a little after the early-mid 50s.

These life cycle patterns give some indication of the possible influence of DB pensions. Exit rates follow a similar pattern by age across sectors but with a deeper and longer-lasting trough for S&LG workers in their 40s and then a somewhat faster increase for S&LG workers from the mid-50s on.

Life cycle exit rates over time. To explore the life cycle exit rates across time periods, I show the key sectors in separate graphs, with Figure 3-B showing life cycle exit rates for the private sector in 1993-94, 1999-00, 2005-06, and 2010-11, and Figure 3-C showing the same years for the S&LG sector. To further assist with observation of these trends, each life-cycle series gets successively lighter in color in later periods, and the text boxes that highlight each series are positioned from top to bottom for the earliest to the latest years. Furthermore, Table 2 shows average exit rates (unsmoothed) by age and year categories.

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[14] After using adjacent cells to smooth by age, I focus here on ages 30-65 rather than ages 18-75. I only used one neighboring cell in each direction to smooth by year so as not to lose any years of data, but this currently imparts a somewhat segmented appearance in some instances.

Focusing first on the period before the Great Recession, exit rates from the private sector (Figure 3-B) were declining a little at all ages. The decline of roughly 1-2 percentage points at prime ages occurred largely during the 1990s. On the other hand, exit rates at older ages continued declining during the 2000s as well. At ages 55-59, for example, as shown in Table 2, Panel A, the average exit rate fell steadily from 14.8% in 1994-96 to 10.4% in 2006-08, and at ages 60-65 it fell even more dramatically, from 24.3% to 16.0%. This suggests an impact of the shift in pension structure from DB to DC during this period.

During the same period, exit rates from S&LG jobs fell by the about the same amount for workers in their 30s and early 40s. Exit rates did not fall, in contrast, for workers in their late 40s and early 50s (and appeared to rise over part of this range) but did fall by similar amounts for workers in their late 50s and early 60s (while remaining than exit rates for private-sector workers at these ages).

These statistics show an overall decline in exit rates, but one that notably did not occur among middle-aged workers in S&LG jobs. It suggests an ongoing role for DB pensions in explaining exits from the S&LG sector.

Lastly, we can see how data on job exit rates reflects the impact of the Great Recession. In the private sector, exit rates increased in this last period at most ages by close to 2 percentage points. The exception is older workers, as workers aged 55-59 had a smaller increase and workers aged 60-64 had a decline in exit rates; this may reflect the increased incentive to delay retirement among older workers experiencing declines in the value of their housing and/or retirement portfolios. Among S&LG workers, the last few years saw a sharp increase in exit rates during middle age, eliminating the dip in exit rates that persisted until the early 50s in earlier years. This suggests a quite strong impact of government budget cuts, perhaps combined with temporary early retirement plans.

V. Extensions and Discussion

It will be possible to extend this analysis by focusing on how patterns differ by skill level and possibly on specific occupations, notably teachers. It will also be interesting to track job flows not only out of sectors but into sectors over the life cycle.

These patterns suggest a possible role for DB pensions in explaining differences in job stability at middle and older ages across sector. Interestingly, younger workers, who have not accumulated much DB pension wealth, do not appear to respond to the gains from accumulations in the distant future, as they exhibit higher exit rates out of S&LG jobs than out of private-sector jobs; they are also, by some accounts, also less aware of the structure of future DB pension accumulations.

These factors further indicate how the S&LG workforce may be affected as governments have begun to change their pension structure. Many state governments, facing extraordinary pressure to bolster pension funding, have changed DB plan parameters in the last few years to reduce pension accumulations. Some of these changes have been limited to new hires, while others have affected existing hires as well, and they have done so in a way that also delays the peak

wealth gains. A substantial number of states have also begun to discuss shifting from DB to DC pensions. These discussions have focused largely on funding issues and have overlooked how the reforms may also affect the S&LG workforce. The evidence presented here suggests that these pension reforms may lead to more exits of middle-aged workers and fewer exits of older workers, in turn affecting payroll and health insurance costs.

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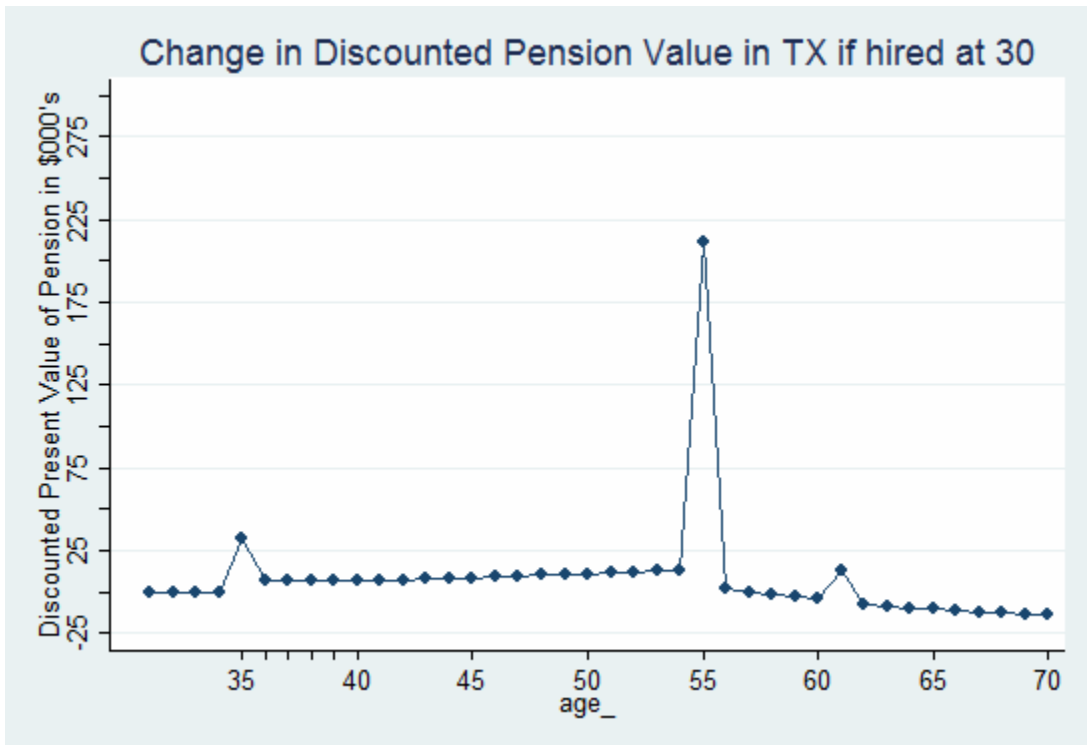
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Figure 1. Pension Wealth Stock and Accrual under the Teacher Retirement System of Texas
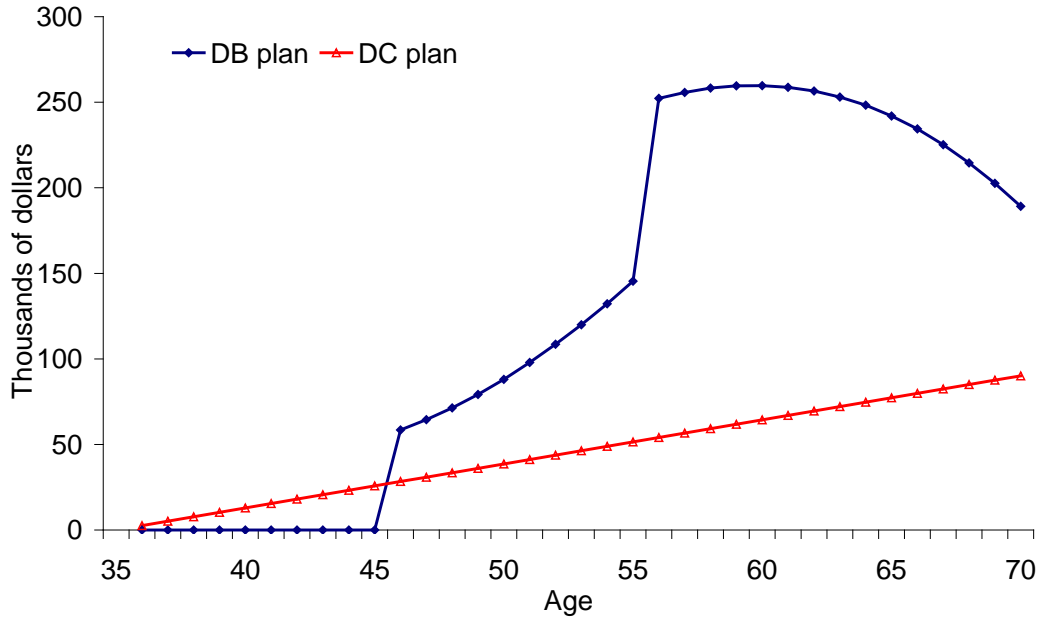
Panel A: Pension Wealth
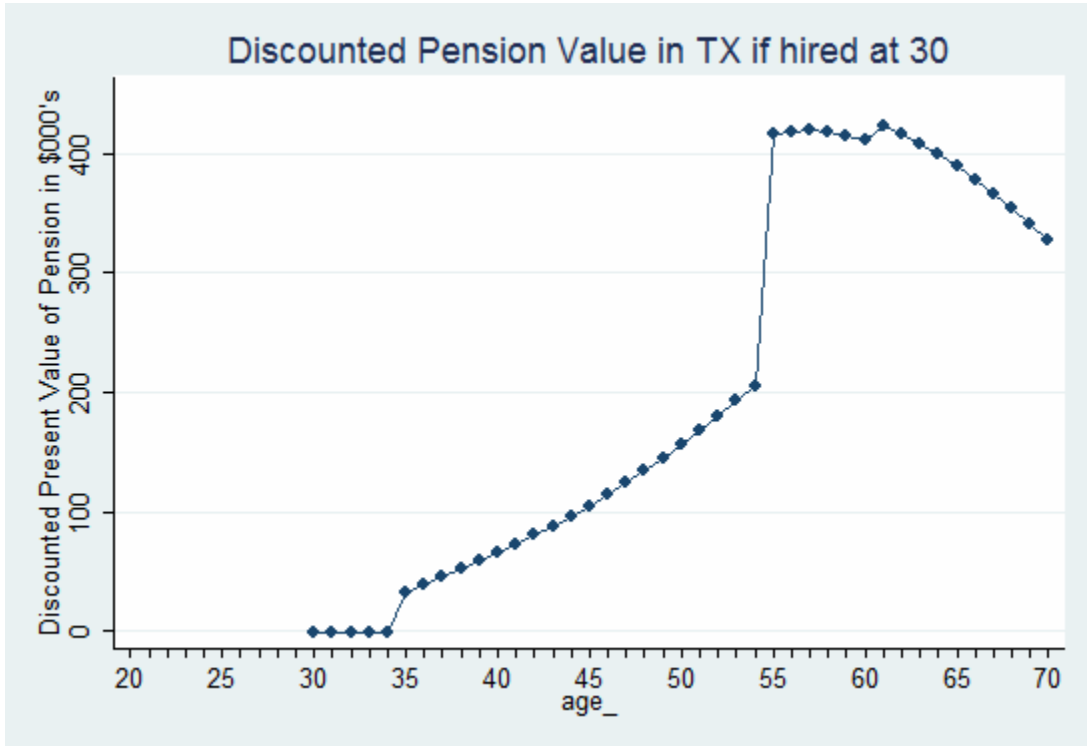
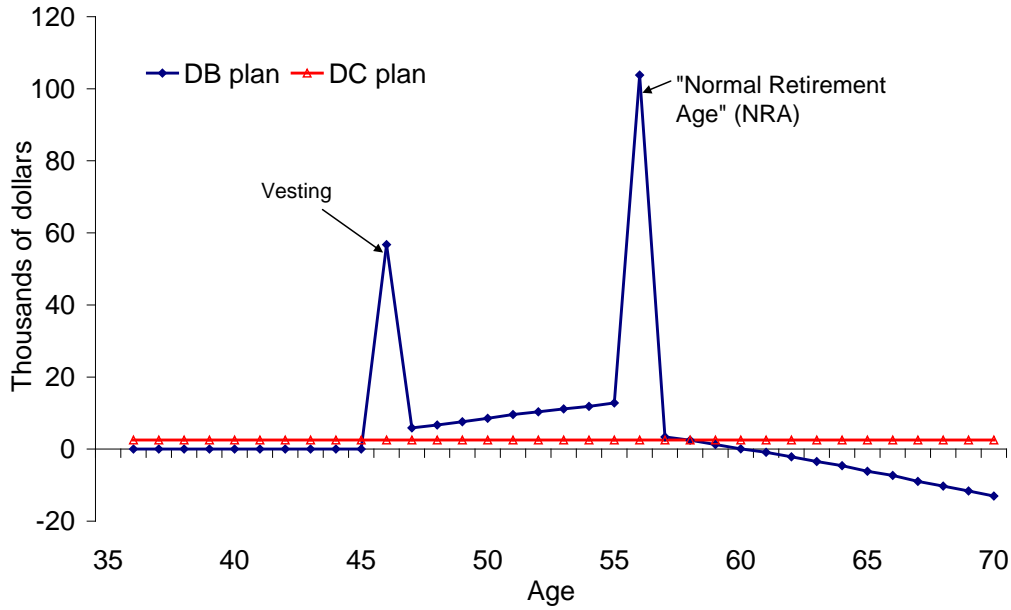
Panel B: Pension Wealth Accrual

Source: Author's calculations.

Figure 2. Pension Wealth Stock and Accrual under a Defined Benefit and Defined Contribution Plan from the HRS
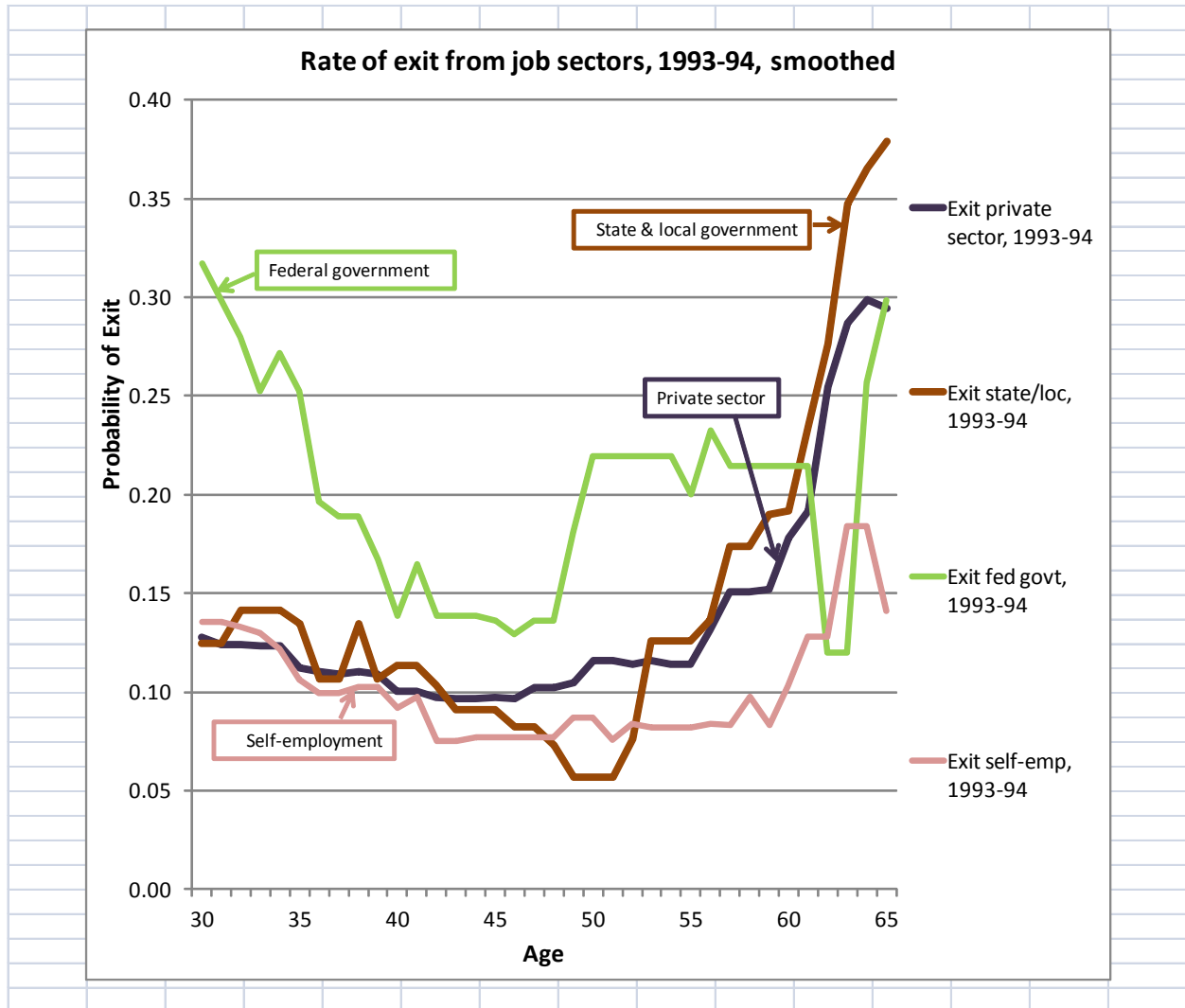
Panel A: Pension Wealth

Panel B: Pension Wealth Accrual

Source: The plans were observed in the 1992 Health and Retirement Study and are reproduced from Friedberg and Webb (2005).

Figure 3-A, Rate of exit from job sectors, 1993-94

Notes: March Current Population Survey, 1994-2011. The sample consists of people who had a job either this year or last year, who were not in the military in either year, who report the sector in which they worked, and who were between the ages of 18 and 75. Sample statistics are computed using March supplement weights.

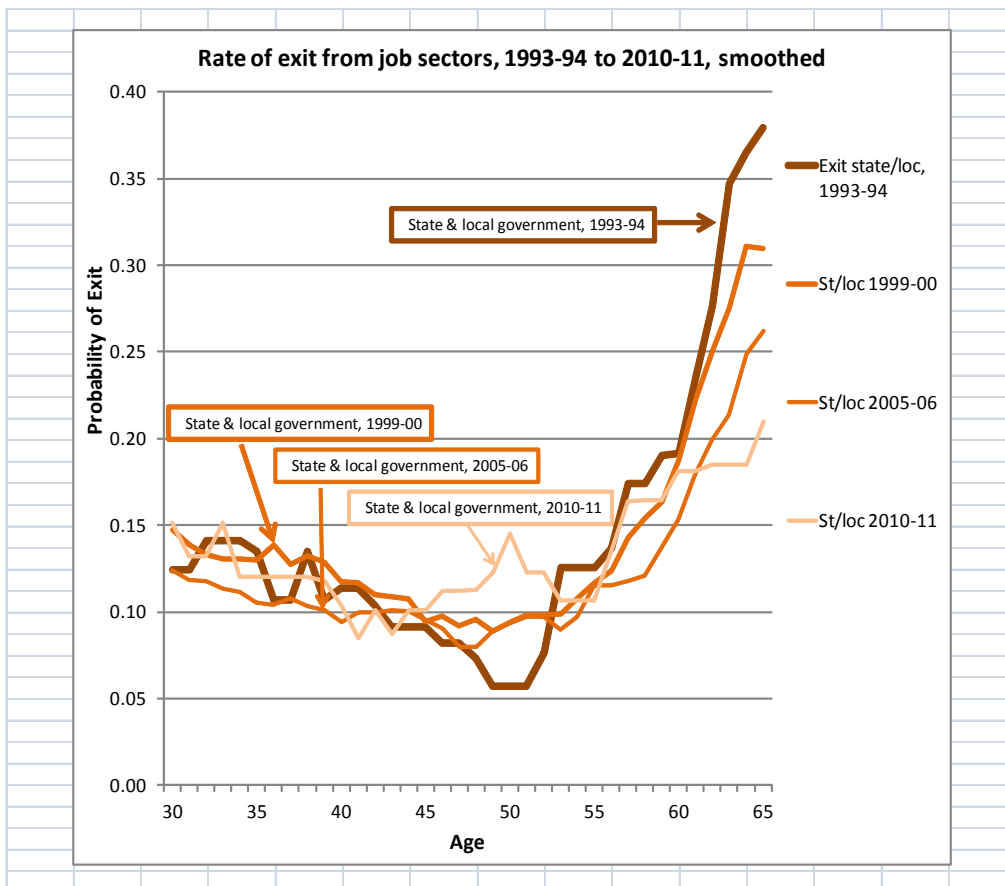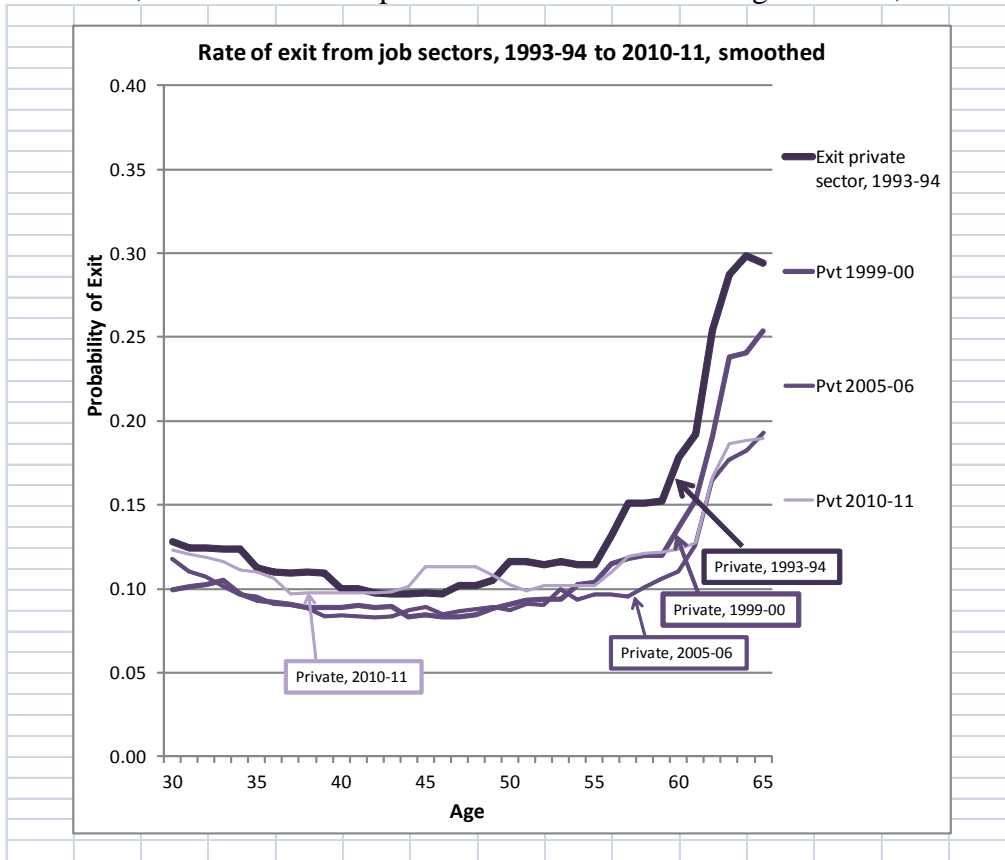Figure 3-B and 3-C, Rate of exit from private sector and state/local govt sector, 1993-94 to 2010-11

Rate of exit from job sectors, 1993-94 to 2010-11, smoothed

Rate of exit from job sectors, 1993-94 to 2010-11, smoothed

Table 1: Summary Statistics					
	Full Sample	Current Sector		Last Year's Sector	
		Private	State/loc gvt	Private	State/loc gvt
	(1)	(2)	(3)	(4)	(5)
Age	39.5	38.3	42.4	38.1	42.6
Male	0.526	0.534	0.403	0.530	0.405
Education					
< high school	0.118	0.127	0.040	0.133	0.044
completed high school	0.322	0.342	0.221	0.341	0.226
some college	0.291	0.294	0.261	0.298	0.263
completed college	0.183	0.174	0.265	0.168	0.257
post-graduate	0.086	0.063	0.212	0.061	0.210
Current work status		Left from:	Left from:	Left from:	Left from:
Not working	0.099	0.022	0.012	-	-
Current sector, if working					
private	0.749	-	0.090	0.137	-
state & local government	0.120	0.013	-	-	0.158
federal government	0.025	0.004	0.006	-	-
self-employed	0.106	0.007	0.003	-	-
Last year work status		Joined:	Joined:	Joined:	Joined:
Not working	0.019	-	-	0.111	0.075
Last year sector, if working					
private	0.760	0.045	-	-	0.075
state & local government	0.117	-	0.111	0.013	-
federal government	0.026	-	-	0.002	0.004
self-employed	0.097	-	-	0.010	0.004
N	1,600,824	1,053,978	182,940	1,172,225	193,327

Notes: March Current Population Survey, 1994-2011. The sample consists of people who had a job either this year or last year, who were not in the military in either year, who report the sector in which they worked, and who were between the ages of 18 and 75. Sample statistics are computed using March supplement weights.

Table 2: Exit rates by age and year in the private, state & local government sectors								
	A: Private sector						Change,	Change,
Age	1994-96	1997-99	2000-02	2003-05	2006-08	2009-11	2006-08	2009-11
	(1A)	(2A)	(3A)	(4A)	(5A)	(6A)	vs. 94-96	vs. 06-08
30-34	0.127	0.110	0.113	0.121	0.109	0.137	-0.018	0.017
35-39	0.117	0.096	0.103	0.105	0.094	0.122	-0.024	0.017
40-44	0.114	0.093	0.095	0.104	0.089	0.122	-0.025	0.018
45-49	0.114	0.094	0.095	0.106	0.093	0.122	-0.020	0.016
50-54	0.118	0.101	0.109	0.103	0.096	0.121	-0.022	0.018
55-59	0.148	0.133	0.124	0.121	0.104	0.133	-0.043	0.012
60-65	0.243	0.206	0.192	0.185	0.160	0.173	-0.083	-0.012
	B: State & local government sector							
Age	1994-96	1997-99	2000-02	2003-05	2006-08	2009-11		
	(1B)	(2B)	(3B)	(4B)	(5B)	(6B)		
30-34	0.144	0.175	0.130	0.122	0.112	0.116	-0.032	-0.007
35-39	0.133	0.134	0.128	0.114	0.104	0.109	-0.029	-0.005
40-44	0.114	0.117	0.118	0.109	0.089	0.101	-0.024	-0.007
45-49	0.100	0.084	0.093	0.087	0.096	0.101	-0.004	0.013
50-54	0.107	0.108	0.096	0.102	0.095	0.107	-0.011	0.005
55-59	0.162	0.122	0.144	0.125	0.111	0.132	-0.051	0.007
60-65	0.273	0.259	0.255	0.217	0.202	0.185	-0.071	-0.031

Notes: March Current Population Survey, 1994-2011. The sample consists of people who had a job either this year or last year, who were not in the military in either year, who report the sector in which they worked, and who were between the ages of 18 and 75. Panel A includes people who were in the private sector (either for-profit or not-for-profit) for their main job last year; Panel B includes people who were in the state and local government sector for their main job last year. Sample statistics are computed using March supplement weights.