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Retirement and the Evolution of Pension Structure

The typical employer-provided pension plan has changed dramatically in the past twenty years. Defined benefit (DB) pension plans have become considerably less common since the early 1980s, while defined contribution (DC) plans have spread. The share of pensioned full-time employees with a 401(k) or other DC plan rose from 40 percent in 1983 to 79 percent in 1998. Those covered by a DB plan similarly declined from 87 percent to 44 percent over the same period.

In **Retirement and the Evolution of Pension Structure** (NBER Working Paper No. 9999), authors **Leora Friedberg** and **Anthony Webb** investigate how the decline in DB pension coverage influences retirement. They find substantial changes in retirement patterns as a result of the spread of 401(k) and other DC plans in place of DB plans. Workers with DC plans are retiring significantly later, which helps explain why employment rates recently have risen among people in their 60s, after decades of decline. Workers with DB plans retire two years earlier on average than workers with DC plans. The authors' simulation suggests that the continuing shift in pension structure will increase the median retirement age by about 10 months when comparing employees with

pensions who will be aged 53-57 in 2015 versus those who were aged 53-57 in 1983.

These changes arise, the authors say, because of major differences in accrual of pension wealth. Pension wealth in DC plans accrues smoothly, while gains to pension wealth in traditional DB plans spike sharply at older ages, then turn negative

wealth is similar across pension type: median financial assets are in the range of \$22,000-26,300. This similarity in wealth outside of pension plans reduces concerns that workers with different retirement preferences deliberately choose jobs with different pension plans; if this were the case and the authors had incorrectly attributed causality from the pension plans to

“Workers with defined contribution plans are retiring significantly later, which helps explain why employment rates recently have risen among people in their 60s, after decades of decline.”

afterwards, creating a financial incentive to retire at that point.

The authors use data from the Health and Retirement Study (HRS), a highly detailed longitudinal survey of over 7,600 households with a member born between 1931 and 1941. They find that people with different types of pensions generally share similar characteristics, except notably in their pension wealth. People with both types of plans have the highest pension wealth: a median of \$345,156 if they retire at age 65. That figure is higher than the sum of the median stand-alone DB plan and the median stand-alone DC plan. In contrast, non-pension

retirement patterns, then workers would be expected to differ in their level of retirement saving as well. In many other dimensions as well, including education, occupation, and earnings, workers with different types of pensions are strikingly similar. It is also notable that industry, unionization, job tenure, and firm size do not significantly influence retirement, although they are related to pension type.

The results suggest that the trend toward later retirement will continue as younger workers, who increasingly have DC pensions, approach retirement.

— Les Picker

The Economic Efficiency of Cancer Drugs

In 1971, President Richard Nixon declared “war on cancer” and the National Cancer Act was enacted. Since that time, both government and industry have devoted enormous resources to fighting this war.

In **The Expanding Pharmaceutical Arsenal in the War on Cancer** (NBER Working Paper No. 10328), author **Frank Lichtenberg** asks, “Are we winning the war?” He analyzes data on 2.1 million people diagnosed with cancer between 1975 and 1995, and concludes that new cancer drugs introduced since 1971 — about two-thirds of the 80 drugs currently used to treat cancer — have increased the life expectancy of those people by about one year, from 9.6 to 10.6 years. His analysis controls for the effects of numerous other factors on cancer survival, including surgery and radiation treatment, cancer site and stage, and age at diagnosis.

Since Americans face a lifetime risk of being diagnosed with cancer of about 40 percent, the one-year addition to life implies that new cancer drugs account for 10.7 percent of the overall increase

in U.S. life expectancy at birth. Life expectancy has grown from 72.3 years to 76.1 years, or by 3.8 years. The estimated cost of the drugs used to attain each additional year of life was less than \$3,000. That is far below recent economic estimates of the value of a statistical life-year of about \$150,000.

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Still, at first blush the data would indicate that the war on cancer is not being won. The age-adjusted U.S. mortality rate from all malignant cancers was essentially the same in 2000 as it was in 1969. During that period, the age-adjusted mortality rate from all other causes of death declined by 38 percent. Cancer today is the leading cause of years of potential life lost before age 75.

But, Lichtenberg notes, the stagnancy of the cancer mortality rate is misleading. The cancer inci-

dence rate — the number of new cancer cases per 100,000 people — was 16 percent higher in 2000 than it was in 1975-9. This is presumably attributable primarily to the decline in mortality from other causes, particularly cardiovascular disease. As medical advances for diseases other than cancer lowered

the risk of dying from those diseases, the risk of developing cancer increased.

But cancer survival rates also increased. There was only a 50 percent probability that a person diagnosed with cancer in 1975-9 would not die from causes associated specifically with the cancer within five years. For a person diagnosed with cancer in 1995, though, that probability had risen to 62.7 percent.

— David R. Francis

Motivating Employees with Stock and Involvement

For decades now, American firms have engaged in a capitalist experiment, helping their employees to become partial owners of their companies in the expectation that this will encourage them to

work harder. Currently, more than one-fifth of U.S. private-sector employees — 24 million workers — own stock in their own companies; eight million participate in Employee Stock Ownership Plans

(ESOPs). The growth of ESOPs over the past 25 years is part of a general trend in compensation arrangements linking worker pay to company performance. These techniques include profit sharing, gain-

sharing, and broad-based stock options in addition to the various methods of employee ownership. Some research shows that firms with employee ownership tend on average to match or exceed the performance of other similar firms. There may be an average 4 to 5 percent gain in productivity with introduction of an ESOP, but with a wide band of outcomes around that average. Several studies find higher satisfaction, commitment, and motivation among employee-owners. Other studies find no significant differences in

Paper No. 10177), authors **Douglas Kruse, Richard Freeman, Joseph Blasi, Robert Buchele, Adria Scharf, Loren Rodgers, and Chris Mackin** explore what companies can do to overcome this problem of how to motivate employee slackers and thereby improve firm performance.

For their study, the authors use data from: a survey of employees and managers in 11 relatively small ESOP companies over the period 1996-2002; three firms surveyed by the NBER's Shared Capitalism Research Project in

presented on the board of directors. The survey also asked about nine methods of sharing information with employees, including new employee orientations and regular meetings with workers at the department or work group level, and whether the company had a formal grievance procedure, a suggestion system, or a cash profit sharing or bonus system.

The results show that a higher human resource index number at a firm results in greater worker-reported work effort and better company performance. However, the size of the stake of *all* employees in an ESOP company had no impact on performance; "This supports the idea that it is not ownership per se, but the cooperative culture that can be fostered by employee ownership, that drives better workplace performance in ESOP firms," the authors write. Performance improves, they add, if workers perceive they are being treated fairly, have good supervision, and have input and influence in the firm.

Some of the data indicate that workers on employee involvement committees, or who are otherwise involved in setting goals for their work group, are more likely to exert peer pressure on shirking co-workers, talking directly with them about their performance, and are less likely to do nothing. "We conclude," the authors write, "that an understanding of how and when employee ownership works successfully requires a three-pronged analysis of: 1) the incentives that ownership gives; 2) the participative mechanisms available to workers to act on those incentives; and 3) the corporate culture that battles against tendencies to free ride."

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these factors between worker owners and non-owners, or before and after an employee buyout of a firm.

For example, employee ownership of United Airlines failed to prevent its bankruptcy, while multiple forms of employee ownership and profit sharing at Science Applications International Corp., a Fortune 500 company engaged in research and engineering, have led to its continued success.

One common problem for employee ownership firms is "free riders" — workers who slack off but, as owners, still receive the rewards of hard work by their colleagues. Especially as a firm grows and the number of workers increases, the link between an individual's performance and financial payoff becomes weaker.

In **Motivating Employee-Owners in ESOP Firms: Human Resource Policies and Company Performance** (NBER Working

2001 and 2002; and a national survey of workers. These new data, the authors find, tend to support the need to combine the incentive of ownership with the involvement of participation.

At the 11 surveyed firms, employees were asked whether they work hard, care about meeting customer needs, are willing to make sacrifices to help co-workers, and are very committed to the company and its future. They also were asked whether company performance is important as long as jobs are secure, and whether employees work less when supervisors are not watching. The authors then devised an index of human resource policies, asking whether they increased employee involvement in job-level decisions with quality circle; autonomous work groups, or employee task forces; if employees had any involvement in new hires; and whether employees were repre-

The Effect of Word of Mouth on Sales: Online Book Reviews

Online booksellers provide customers with reviews and rankings of the books that they offer for sale. In **The Effect of Word of Mouth on Sales: Online Book Reviews** (NBER Working Paper No. 10148), authors **Judith Chevalier** and **Dina Mayzlin** use a snapshot of sales data from two large online booksellers to determine whether customer comments posted on a bookseller's website influence a book's sales by that retailer. After controlling for differences in the price of a book and its promised delivery time across the two sites, they examine whether differences in the reviews across the two sites influence relative sales. They find that sales increase with the number of "stars" awarded by online reviewers. However, the decrease in sales associated with a negative customer book review is greater than the increase in sales generated by a positive review. The results also hold when the researchers use a "differences in differences" approach: that is, changes in the relative enthusiasm of the customers' reviews of a book across

the two sites between two points in time are associated with changes in the relative sales of the book at the two sites. The authors conclude that these results are consistent with the idea that "customer word-of-mouth has a causal impact on consumer purchasing behavior."

books at the two sites were inferred from the websites' sales rankings, collected in May and August of 2003. To be included in the sample, a book's most popular format had to be the same at both websites, and its sales had to be above a specified level.

"Sales increase with the number of 'stars' awarded by online reviewers. However, the decrease in sales associated with a negative customer book review is greater than the increase in sales generated by a positive review."

Although their evidence is insufficient to show that a retailer profits from providing customer reviews, they nonetheless conclude that "customers certainly behave as if the fit between customer and book is improved by using reviews to screen purchases."

For this study, the total sample of 2394 book titles is comprised of two sub-samples: a random sample of book titles that were published between 1998 and 2002; and books that appeared on the *Publisher's Weekly* bestseller lists from 1991 to 2002. Sales of the

One interesting puzzle is why customers put time and energy into providing these reviews. At one online retailer, 54 percent of the titles in the sample had at least one customer review. At the other, the number was just 13 percent. On average, customer book reviews are quite enthusiastic. Over 50 percent of the reviews on the online websites awarded the highest possible ranking to the book reviewed. Fewer than 10 percent of all reviews assigned the lowest possible ranking.

— Linda Gorman

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