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The Path of Least Resistance in 401(k) Plans

Enron's collapse has put company-sponsored 401(k) retirement plans under the spotlight. As well as losing their jobs, Enron employees lost most of their investment in 401(k) plans that was concentrated overwhelmingly in Enron stock. The Enron example highlights two important issues: the power employers have over their employees' 401(k) accounts and the importance of encouraging appropriate investment decisions. These are addressed in two timely NBER Working Papers by **James Choi**, **David Laibson**, **Brigitte Madrian**, and **Andrew Metrick**.

The common theme in these studies is that employees tend to be "passive decisionmakers" taking the path of least resistance. This means that employers have a great degree of control over savings and investment decisions employees make in 401(k) plans. Employers and policymakers need to recognize that there is no such thing as a neutral menu of options for a 401(k) plan but rather that how the decisions are framed will affect the choices that employees make. Of particular importance are the default options that apply to enrollment in the 401(k) plan, the default options that apply to plan balances when employment is terminated, the threshold at which employers match 401(k) contributions, and the menu of fund options that are available to employees.

Although there are some limits, companies have broad discretion over the design of the 401(k) plans they offer. One plan design feature that has been increasing in popularity over the past few years is automatic enrollment. Standard economic theory suggests that automatic enrollment should make no difference to employee savings outcomes because it does not change the savings options faced by employees. In **For Better or for Worse: Default Effects and 401(k) Savings Behavior** (NBER Working Paper No. 8651), Choi and his coauthors show that this presumption could not be farther from the truth.

Using administrative data from three companies, the researchers conduct a detailed study on the impact of automatic enrollment on 401(k) savings outcomes. Although employees subject to automatic enrollment can opt out of the 401(k) plan at any time, few choose to do so. As a result, automatic enrollment has a dramatic impact on retirement savings behavior: 401(k) participation rates at all three companies exceed 85 percent, regardless of the tenure of the employee. Prior to automatic enrollment, 401(k) participation rates ranged from 26-43 percent after six months of tenure at the three firms and 57-69 percent after three years. The researchers also find that the participation increases are most important for those least likely to participate in standard retirement savings plans: the young, lower-paid, black, and Hispanic employees.

Although automatic enrollment results in substantially higher 401(k) participation rates, employees hired under automatic enrollment tend to follow the path of least resistance when it comes to

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how they participate in the 401(k) plan — they tend to stick with the low company-specified default contribution rate (2 or 3 percent for the three companies studied) and to remain in the default (conservative) investment fund chosen by the company (either a stable value or a money market fund). In the three companies, 65-87 percent of plan participants save at the default contribution rate and they invest exclusively in the default fund. While this percentage declines slowly over time, after two years of tenure 40-54 percent of participants are still at the default.

What impact will automatic enrollment have on long-run asset accumulation? While automatic en-

rollment encourages 401(k) participation, it anchors participants at a low savings rate and in a conservative investment vehicle. Higher participation rates promote wealth accumulation but the low default savings rate and the conservative default investment fund may actually lower employee wealth accumulation over a long period. In their investigation of the employees in the three companies studied, the NBER researchers find that the two effects are roughly offsetting on average. Although automatic enrollment has little impact on average long-run wealth accumulation, it does reduce the overall variance in wealth accumulation across employees. This is in part because automatic enrollment increases 401(k) participation among lower-paid employees and in part because some employees who would have participated in the plan without automatic enrollment do not bother to select an alternative to the automatic enrollment defaults and thus have a lower contribution rate and a lower return asset allocation than they would otherwise have.

In **Defined Contribution Pensions: Plan Rules, Participant Decisions, and the Path of Least Resistance** (NBER Working Paper No. 8655), Choi and his co-authors suggest that automatic enrollment is only one example of the many ways in which employees follow the path of least resistance when it comes to 401(k) savings outcomes. After examining the administrative records of several anonymous U.S. corporations, the authors find that employees tend to do whatever requires the least effort. Though surveys suggest that workers often feel that they save too little, and intend to raise their contribution rates, few ever do so unless employers offer a low-effort opportunity, such as signing up for an automatic schedule of increases in their contribution rate.

When employees leave a job, the default treatment of 401(k) balances of terminated employees largely determines what happens to their accumulated savings. When balances are small (less than $5000), employers can send employees a check for the value of the balances whether the employee requests it or not, and such cash distributions tend to be consumed rather then saved. When balances are large (more than $5000), employers cannot legally force a cash distribution on terminated employees. In this case, the balances by default remain at the previous employer, and only a small percentage of employees elect some other action for their accumulated balances, for example a cash distribution or a roll-over to another 401(k) plan. When employers offer a match in the 401(k) plan, many employees elect to contribute at the threshold at which the employer ceases to match employee contributions because the match threshold provides a convenient focal point.

Even in the case of savings decisions over which employees are required to exert some effort, such as investment allocation choices in the absence of automatic enrollment, the plan's design also can influence savings outcomes. For example, employees tend to have asset allocations that are more heavily weighted toward equities when the plan offers more equity choices to its employees.

While many individuals have advocated financial education as a way to promote better savings outcomes for employees, the NBER researchers suggest that in the presence of the employee behaviors just described, financial education cannot be viewed as a panacea. They examine the effectiveness of financial education in one company by linking attendance data from financial education seminars to subsequent data on actual savings outcomes. They find that individuals who receive financial education are both more likely to enroll in the 401(k) plan if not already participating and more likely to diversify their asset holdings than employees who do not receive financial education. However, they also find that less than one-third of the employees who say they intend to make changes to their 401(k) savings plan actually do so. Thus, while financial education does motivate changes in savings behavior, its effects are limited at best.

On the basis of this research, the authors conclude that employers can exert a strong influence on the savings and investment choices of their employees through their design of retirement savings plans. Whatever savings plan an employer creates will favor certain passive or nearly passive choices over other choices that require more effort. The researchers suggest that employers seeking to increase employee savings could adopt automatic enrollment with more aggressive defaults, including defaults that slowly raise the employee's contribution rates over time. They also could automatically roll over the 401(k) balances of terminated employees into an IRA rather than compelling a cash distribution if account balances are small. They could choose a higher match threshold to motivate higher savings rates, and they could offer employees well thought-out investment options.

Policymakers also should recognize that the government can affect economic outcomes, with laws and regulations, through the use of defaults. For example, firms may be wary of increasing the aggressiveness of the default investment fund under automatic enrollment, since choosing a fund that includes equity exposure may leave the company vulnerable to employee lawsuits when volatile asset classes suffer capital losses. Policymakers could address this concern by giving companies legal protections to encourage them to pick higher return default investments, like the S&P 500, rather than the money market and stable value funds that are the choice of most employers who have automatic enrollment.

— Andrew Balls

Higher Downside Risk Brings Greater Returns

In **Downside Risk and the Momentum Effect** (NBER Working Paper No. 8643), authors **Andrew Ang**, **Joseph Chen**, and **Yuhang Xing** show that there is a premium for holding stocks with a higher downside risk. They find that stocks that are highly correlated with the market when the market declines have higher expected returns than stocks that are not highly correlated with the market during its downturns. The difference between portfolios with the most downside risk and the least downside risk is very large, more than 6.5 percent per year. The researchers find that some of the profitability of the recently observed momentum effect (that stocks with high past returns continue to have high future expected returns) can be explained as compensation for bearing exposure to downside risk.

The concept of downside risk, according to Ang, Chen, and Xing, is highly intuitive. Stocks that are more likely to decline when the market return is below its mean are less attractive. In order for investors to hold these assets, the average return on these stocks must be higher (to compensate for their increased downside risk). The premium compensates investors for extreme periods when the market crashes, times when these high-downside-risk stocks crash along with the market. By meticulously analyzing portfolios, the authors show that the high expected returns commanded by stocks with high downside risk cannot be explained by market risk, the size effect, or the book-to-market effect, and cannot be attributed to liquidity.

Since the traditional risk factors cannot price the high returns on high-downside-correlation stocks, the authors construct a "mimicking factor" that captures the high downside risk premium. This downside

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risk factor shorts stocks with low downside risk (these stocks have low expected returns) and goes long on stocks with high downside risk (these stocks have high expected returns). The authors find that their downside risk factor forecasts future macroeconomic conditions and prices (by construction) the downside correlation effect.

Conventional explanations of the momentum effect use behavioral models with imperfect information and investor behavior and rely on the fact that arbitrage is limited, so that arbitrageurs cannot eliminate the apparent profitability of momentum strategies. In this paper, the authors show that momentum strategies have high exposures to the systematic downside risk factor, and this exposure to downside risk cannot be arbitraged away. In particular, stocks with high past returns have greater exposure to the downside risk factor than stocks with low past returns. That is, past "winner stocks" do well because, during periods of extreme market distress, these stocks are much more likely to crash with the market than stocks that are past losers. Therefore, some portion of the profitability of momentum strategies can be explained as compensation for bearing downside risk.

The researchers note that because downside risk is priced and stocks' sensitivities to downside risk play a role in asset pricing, theoretical models are needed to explain the underlying economic mechanisms that bring about the downside correlation effect. It remains to be determined, the authors conclude, whether risk aversion, loss aversion, or other factors best explain the mechanism driving cross-sectional variations in downside risk.

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Taxes and Health Insurance

In 1987, 14.8 percent of non-elderly Americans were without health insurance. By 1997, 18 percent of the non-elderly population did not have health insurance, a 25 percent increase. Despite a recent decrease in that percentage, 40 million non-elderly Americans still lack health insurance. A common prescription for reducing the number of uninsured is to introduce new tax subsidies for health insurance costs. Yet federal and state governments already spend over $100 billion annually in subsidies to health insurance, by excluding employer spending on health insurance from taxable employee wages.

In **Taxes and Health Insurance** (NBER Working Paper No. 8657), NBER Research Associate **Jonathan Gruber** investigates what we have learned about the effects of the existing tax subsidy to health insurance, and what it implies for future tax policy towards the uninsured. He documents that the primary reason employees are uninsured is that they are not offered insurance in the workplace. Small and low wage firms in particular are unlikely to offer insurance. Take-up of insurance when offered, in contrast, is quite high in all types of firms.

Gruber notes that there are a variety of avenues through which tax policies can affect insurance status, and he reviews the evidence on responsiveness along these dimensions. He concludes that the decisions of small firms to offer health insurance are fairly sensitive to the tax subsidization of insurance prices. Moreover, among firms that offer health insurance, the level of insurance spending is very sensitive to tax subsidies; this partly reflects a shifting of costs to employees as employer spending is less subsidized.

On the other hand, worker decisions to take-up insurance do not appear to be price sensitive. There

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does seem to be some scope for substitution between private and public coverage as the relative subsidies of these forms of insurance change, as well as scope for switching coverage across spouses. But there remain important unanswered questions, particularly about the sensitivity of the uninsured to subsidies to the price of insurance, and how the insurance market would react to widespread subsidies.

Gruber draws on this evidence to discuss its policy implications. His findings suggest that removing or reducing the existing tax subsidy to employer-provided health insurance could lead to significant increases in the number of uninsured. For example, completely removing the tax subsidy to health insurance would lead to 22 million workers losing their employer-provided insurance coverage. Likewise, subsidies to small and low wage employers to offer insurance could significantly increase insurance coverage.

But subsidies to employee spending on insurance are unlikely to be an effective route, since take-up among eligible employees is already so high and their take-up decisions do not appear to be price sensitive. Subsidies to non-group insurance purchase would allow significant numbers of uninsured to purchase insurance, but would also subsidize the existing spending by those holding non-group insurance, and would potentially erode the group market. Given the high costs of insurance in the non-group market, subsidizing insurance in that market may be a very costly means of reducing the number of uninsured.

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Value of S & P Membership is Growing

At cocktail parties, finance professors often are pressed for investment advice, and they typically recommend a well-diversified index fund. "This advice may have been far sounder than its propagators ever imagined," note NBER Research Associate **Randall Morck** and co-author **Fan Yang**.

Finance professors in general are aware of the "Efficient Markets Hypothesis," more popularly dubbed "the dartboard theory of investing." This theory holds that it is impossible to pick stocks that will perform better than average on a risk adjusted basis, unless an investor has inside information. This is because no publicly available information is useful in predicting stock returns. Stock investors, and there are millions of them, quickly act on any new information about a stock. So the market price of a share moves almost immediately and efficiently to an appropriate price. Thus, an investor might as well pick stocks by throwing darts at a list from the *Wall Street Journal* as go to the trouble of making a reasoned and calculated selection.

The optimal strategy, therefore, is to keep transactions and management costs low and to remain widely diversified. "Index funds generally accomplish these two goals better than other investment channels available to typical cocktail party guests," Morck and Yang write in **The Mysterious Growing Value of S&P Membership** (NBER Working Paper No. 8654).

In this paper, they attempt to solve the Wall Street mystery of why the price of a stock jumps when it is added to the list of Blue Chip companies whose shares make up the Standard & Poor's 500 Index. Their conclusion is that the growing popularity of index membership since the mid-1980s has pumped up the price of S&P 500 stocks relative to stocks of other similar companies outside the index. It's an "indexing bubble," similar to the recent bubble in Internet stocks, that has economic consequences.

An alternative interpretation of the value premium of membership in the S&P 500 index is that Standard & Poor's analysts are able to pick stocks with mysterious intangible assets that justify abnormally high valuations. To test the two explanations, Morck and Yang compile a list of companies not in

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the S&P index but comparable to the S&P member companies. They look at the firms listed in Compustat (a Standard & Poor's service) for the years 1978 to 1997 and, for companies in and out of the index, they calculate the average "Tobin's q ratio" — this is the valuation of a firm by financial markets, reflected in the total value of its stocks, bonds, bank debt, and so on, divided by the replacement cost of the company. This measure, in effect, compares the values seen by financial markets and by accountants.

The authors find that the S&P 500 stocks appear overvalued relative to comparable companies, and that this apparent overvaluation increases closely in step with the increase over time in index fund assets. Of course, it could be that S&P analysts grew steadily better at selecting stocks with lasting premiums for its index precisely in line with the growth of indexing, but the authors argue that such a coincidence is unlikely.

For reasons not entirely clear, arbitrageurs do not correct this overvaluation by buying the stocks of the non-index companies that are undervalued by comparison. Also, the authors have yet to extend their analysis beyond 1997 when the bullish stock market subsequently became bearish.

In response to the S&P premium, the authors add, index funds could buy financial instruments known as derivatives to get the same index-tracking behavior of their shares as buying the actual stocks in the index (although this won't help if derivatives' issuers in turn hold index stocks to hedge their exposure). Or, companies within the index could issue more stocks to take advantage of the premium and use the money to buy productive assets or even whole firms not in the widely-followed indexes. Thus, indexing could cause economically inefficient over-investment by index member firms and economically inefficient merger and acquisition activity.

Another response would be for funds engaged in passive investment (buying and holding broadly diversified portfolios of stocks) to buy and hold a diversified portfolio of randomly selected stocks, rather than all funds investing in the same 500 stocks. That would have the "salubrious" effect of spreading passive demand for stocks across the market more evenly.

— David R. Francis

Mental Illness and Substance Abuse

Mental illness is defined as an abnormality in cognition, emotion, mood, or social function, which is severe in level or duration. Many people experience personal upheavals, but a true diagnosable mental illness affects about 24 percent of the U.S. population in any given year. Still, a staggering 43 percent of the population has had a diagnosable mental illness at some point in their lives.

There is a definite connection between mental illness and the use of addictive substances. Individuals with an existing mental illness consume roughly 38 percent of all alcohol, 44 percent of all cocaine, and 40 percent of all cigarettes. Furthermore, the people who have ever experienced mental illness consume about 69 percent of all the alcohol, 84 percent of all the cocaine, and 68 percent of all cigarettes.

Previously economists showed that price increases reduce the use of alcohol, illegal drugs, and tobacco. NBER Research Associate **Henry Saffer** and co-author **Dhaval Dave** theorize that if mental illness does alter the demand for addictive goods, then those individuals' consumption may be either more or less responsive to higher prices. In **Mental Illness and the Demand for Alcohol, Cocaine, and Cigarettes** (NBER Working Paper No.

8699), they propose that if people with mental illness are strongly affected by increased prices, then tax increases are a justifiable method for reducing consumption within this high-consuming group.

The researchers analyze data from a 1991 survey of 8,098 respondents conducted by the National Comorbidity Survey (NCS), a congressionally mandated study of mental illness in the United States.

researchers discover that, when other factors are held constant, mental illness does increase use of addictive goods — relative to use by the overall population — by 20 percent for alcohol, 27 percent for cocaine, and 86 percent for cigarettes. A history of mental illness increases participation (relative to participation in the overall population) by 25 percent for alcohol, 69 percent for cocaine, and 94 percent

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The survey defines 12 disorder groups; individuals were classified as mentally ill if they met the criteria for any one of the disorders. The survey also contained a series of detailed questions regarding alcohol, cocaine, and tobacco consumption. Information about the subject's family history and stressful life events, such as legal problems, loss of a close relationship, and poor physical health, also were obtained.

The data allow Saffer and Dave to address the effect of mental illness on the level of both consumption and price sensitivity. The

for cigarettes. Family history increases consumption of alcohol and cocaine for the mentally ill, but the influence is actually weaker than for those without mental illness.

The authors find that individuals with mental illness are sensitive to price changes, but that their sensitivity to price changes is roughly similar to those who are not mentally ill. The increased prices of the addictive good will dampen its use by the mentally ill, so alcohol and tobacco taxes may be a valuable policy tool.

— Marie Bussing-Birks