Should investors hold more equities near retirement, or less?

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Professors Michael Drew and Anup Basu have recently argued that portfolio risk should increase as retirement nears, rather than decrease, as is the practice of lifecycle funds. In a recent paper, "Portfolio Size Effects in Retirement Accounts: What Does it Imply for Lifecycle Asset Allocation", published in the April, 2009 issue of the ***Journal of Portfolio Management***, the professors describe research that concludes that investors with a 40-year horizon are 12.5% richer on average with a "glide path" that operates in the opposite direction of lifecycle funds, increasing rather than decreasing equity allocation through time. They also conclude that there is a 90% probability of being richer with an increasing equity glide path. Michael Drew is a professor of finance and economics at Griffith University, Brisbane, Australia and Anup Basu is professor at Queensland University of Technology, also in Brisbane. To reach their conclusions the co-authors ran 10,000 simulations of 40-year returns, using data from 1900 to 2004.

Pensions and Investments reported on the article on July 13, 2009: "Academic: More equities near retirement" by reporter Jeff Nash. Reactions to the professors' findings center on risk, and its appropriateness near retirement. Don Ezra of Russell is quoted as saying "Risk, after all, has a friend called pain." In other words, Professors Drew and Basu have merely rediscovered that investors, gratefully, tend to get rewarded for taking risk. If risk weren't rewarded on a reasonably regular basis, no one would take it.

So the real issue is: Is the reward commensurate with the risk? To examine this trade-off, I've evaluated the increase in risk that accompanies an increasing equity allocation. I take the position that the amount of a potential loss is what matters, rather than the percentage loss. In other words, losing $100,000 in a $million portfolio is substantially worse than a $1 loss on a $10 portfolio, even though both are 10% losses. I also define risk to be the risk of loss, rather than volatility. Combining these concepts, I have calculated the dollar-weighted downside deviation of returns over 40-year periods using glide paths that progress forward through time with decreasing equities, and contrast these to the same glide path executed in reverse with increasing equity allocations. I use the PLANSPONSOR On-Target Index (OTI) glide path, which is entirely in risky assets for the first 20 years and then moves to zero during the next 20 years. The proxy for risky assets is 70% S&P500 stocks and 30% Citigroup High Grade Bonds. The proxy for risk-free is Treasury bills, and downside deviation is measured as return below Treasury bills. The investor is assumed to contribute $1000 initially and to increase this $1000 by 3% per year.

The table at the end of this paper provides details on the 44 40-year calendar periods from 1926-2008. The columns in the table are as follows:

Fwealth: Ending wealth when the glide path moves Forward, ending at zero in risky assets
Bwealth: Ending wealth when the glide path moves Backwards, ending at 100% risky assets
Fret: Annualized return using the Forward glide path
Bret: Annualized return using Backward glide path
FDown: Equal-weighted downside deviation for Forward path
BDown: Equal-weighted downside deviation for Backward path

$Fdown: Dollar-weighted downside deviation for Forward path
$Bdown: Dollar-weighted downside deviation for Backward path

Here are some observations from the table:

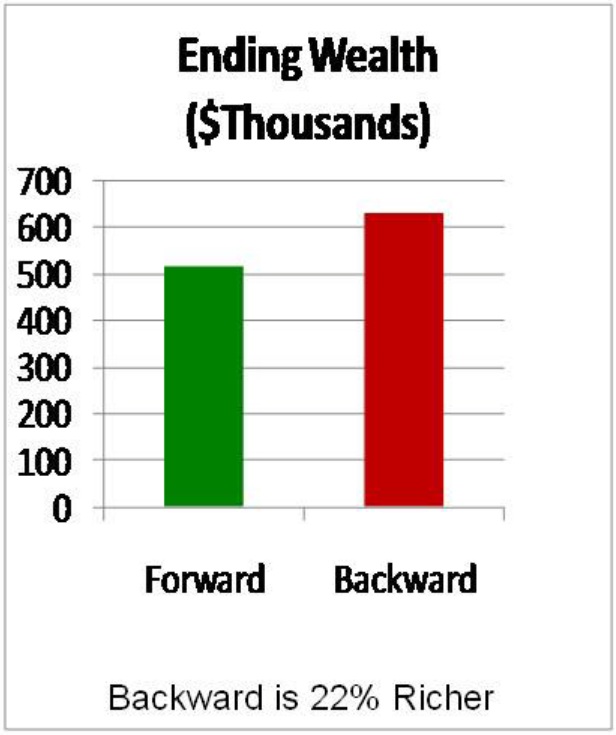
- Average ending wealth for the Backward path of $630,940 is 22% greater than the corresponding $515,570 ending wealth for the Forward path. This is even larger than the professors 12.5% result.
- Forward beats Backward in 13 of the 44 40-year periods, which is 30%, substantially greater than the 10% in the article.
- Annualized returns and equal-weighted downside risks are about the same moving forward or backward.
- Dollar-weighted downside deviation for the Backward path is substantially higher in all periods, averaging 75% higher than the Forward path.

In other words, the increasing equity allocation approach creates 12.5% (professors) to 22% (my research) greater wealth, but at a whopping 75% increase in risk. That's a lot of pain for not all that much gain.

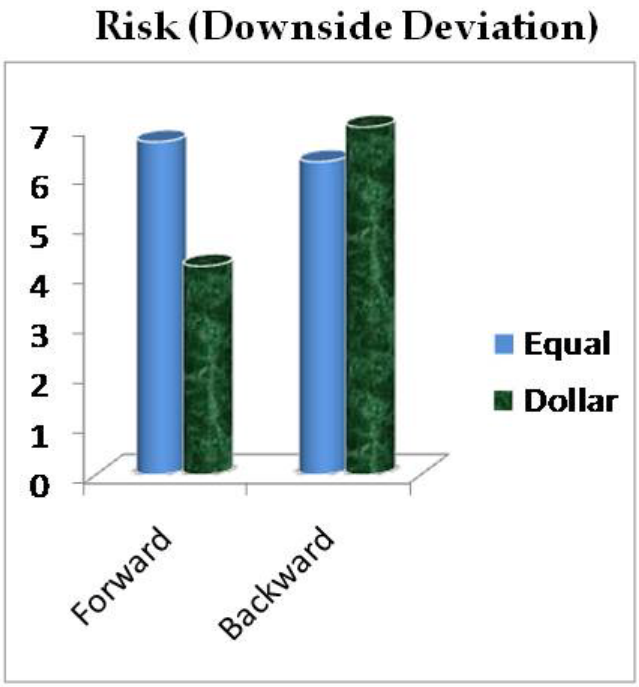
The following exhibit summarizes the key conclusions.

OTI Glidepath for All 40-year Periods 1926-2008 (44 40-year periods)

($1,000 initial balance, plus $1k/yr increasing at 3%/yr)



Backward is 22% Richer



Backward is 75% Riskier

From-To	Fwealth	Bwealth	Fret	Bret	FDown	BDown	$Fdown	$Bdown
1/1926-12/1965	401	630.13	7.72	8.42	9.71	6.77	4.16	5.18
1/1927-12/1966	414.79	538.95	7.76	7.98	9.71	6.52	3.99	5.47
1/1928-12/1967	425.66	568.48	7.39	8.14	9.72	6.21	3.84	5.44
1/1929-12/1968	443.01	568.57	6.98	8.19	9.74	5.91	3.72	5.38
1/1930-12/1969	470.13	478.83	7.41	7.77	9.38	5.77	3.64	5.79
1/1931-12/1970	487.97	474.49	8.12	7.8	9.05	5.76	3.61	6.33
1/1932-12/1971	500.63	490.15	9.37	7.9	7.99	5.59	3.6	6.24
1/1933-12/1972	486.07	514.3	9.57	7.92	7.06	5.4	3.61	5.97
1/1934-12/1973	478.27	423.36	8.78	7.38	6.68	5.42	3.62	6.32
1/1935-12/1974	476.03	310.41	8.91	6.54	6.58	5.76	3.67	7.16
1/1936-12/1975	457.03	368.8	8.25	7.01	6.63	5.7	3.76	7.11
1/1937-12/1976	449.15	410.89	7.81	7.37	6.67	5.59	3.86	6.86
1/1938-12/1977	451.68	356.71	8.76	7.05	6.31	5.58	3.98	6.83
1/1939-12/1978	442.62	339.58	8.36	6.94	5.74	5.69	4.08	7.04
1/1940-12/1979	451.04	342.74	8.53	7	5.55	5.79	4.18	7.2
1/1941-12/1980	464.12	378.48	8.98	7.29	5.05	5.91	4.27	7.33
1/1942-12/1981	487.49	330.99	9.56	6.92	5.05	6.15	4.36	7.81
1/1943-12/1982	477.03	385.31	9.42	7.27	5.13	6.16	4.43	7.67
1/1944-12/1983	474.13	409.78	9.22	7.42	5.2	6.17	4.51	7.48
1/1945-12/1984	474.43	408.85	9.11	7.4	5.35	6.21	4.56	7.43
1/1946-12/1985	469.93	489.21	8.72	7.89	5.48	6.18	4.6	7.07
1/1947-12/1986	477.17	531.42	9.12	8.14	5.4	6.27	4.62	7.23
1/1948-12/1987	479.2	508.08	9.3	8.01	5.52	6.69	4.61	8.74
1/1949-12/1988	479.44	533.94	9.42	8.1	5.51	6.68	4.61	8.36
1/1950-12/1989	490.17	620.02	9.42	8.44	5.66	6.65	4.61	7.88
1/1951-12/1990	495.04	570.28	9.19	8.17	5.78	6.82	4.61	8.32
1/1952-12/1991	499.74	670.77	9.09	8.58	5.9	6.79	4.61	7.96
1/1953-12/1992	493.77	669.11	8.96	8.55	6.01	6.75	4.61	7.52
1/1954-12/1993	490.15	687.77	9.1	8.58	6.11	6.69	4.61	7.07
1/1955-12/1994	485.08	636.7	8.5	8.39	6.24	6.71	4.6	7.05
1/1956-12/1995	499.44	788.98	8.28	9.02	6.35	6.62	4.57	6.58
1/1957-12/1996	520.92	858.12	8.52	9.29	6.39	6.55	4.53	6.3
1/1958-12/1997	548.78	1008.08	9.01	9.74	6.41	6.54	4.48	6.31
1/1959-12/1998	572.77	1153.05	8.7	10.17	6.52	6.65	4.4	7.02
1/1960-12/1999	607.79	1225.14	8.87	10.4	6.6	6.6	4.32	6.78
1/1961-12/2000	647.42	1110.92	9.18	10.18	6.61	6.67	4.24	7.21
1/1962-12/2001	663.64	987.05	8.98	9.96	6.69	6.78	4.19	7.73
1/1963-12/2002	660.5	801.82	9.28	9.47	6.59	6.92	4.17	8.17
1/1964-12/2003	642.6	909.12	9.02	9.91	6.68	6.81	4.21	7.82
1/1965-12/2004	635.52	930.45	8.88	10.09	6.78	6.7	4.28	7.5
1/1966-12/2005	642.08	905.65	8.9	10.14	6.86	6.59	4.36	7.19
1/1967-12/2006	658.51	931.51	9.36	10.31	6.85	6.47	4.43	6.88
1/1968-12/2007	666.9	893.87	9.26	10.32	6.89	6.38	4.48	6.69
1/1969-12/2008	646.49	610.52	9.17	9.38	6.93	6.85	4.52	7.98
Average Column	515.57	630.94	8.78	8.43	6.66	6.3	4.24	7.03