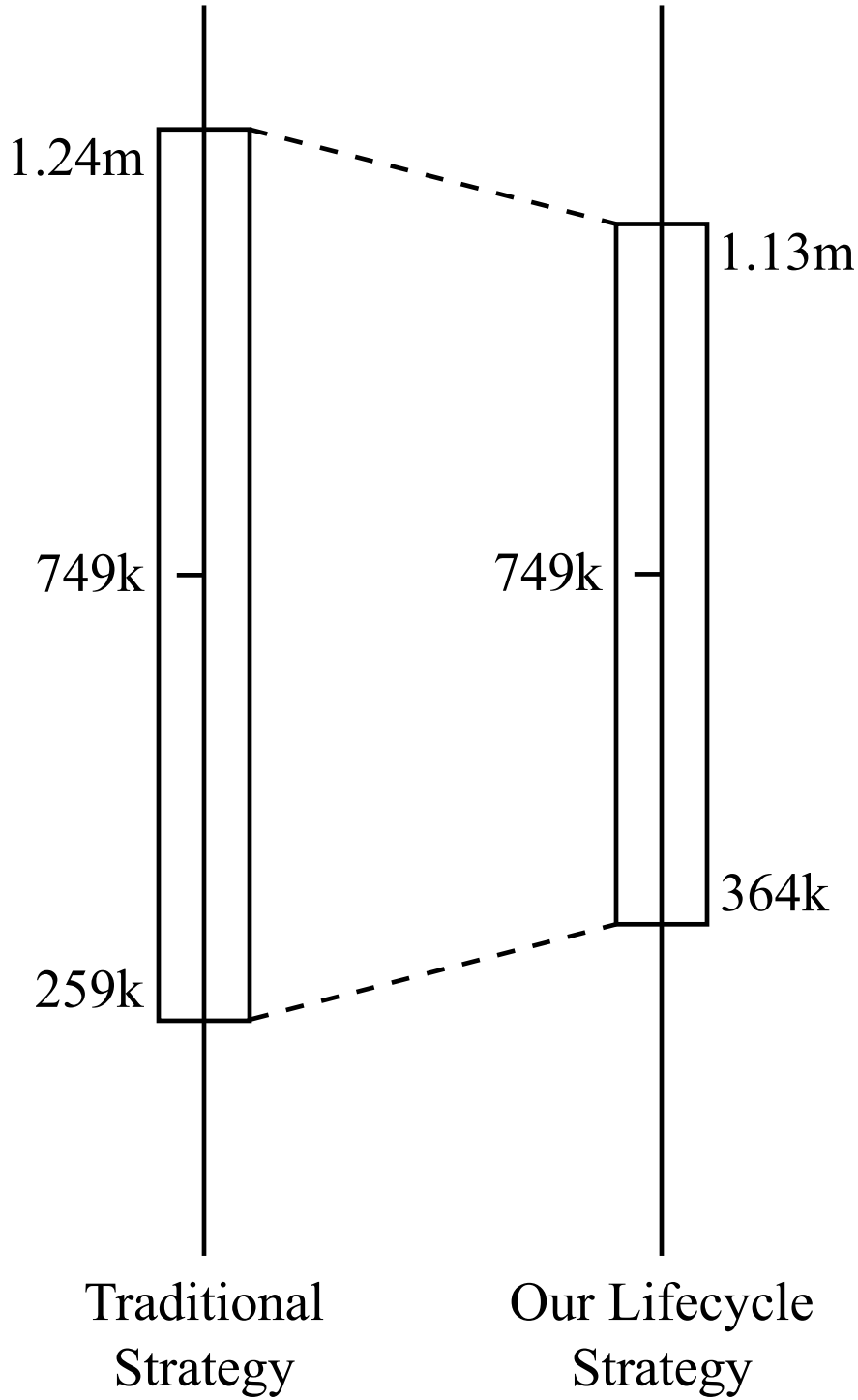


FIGURE INTRO.1
Same Returns with Lower Risk

FIGURE 1.1

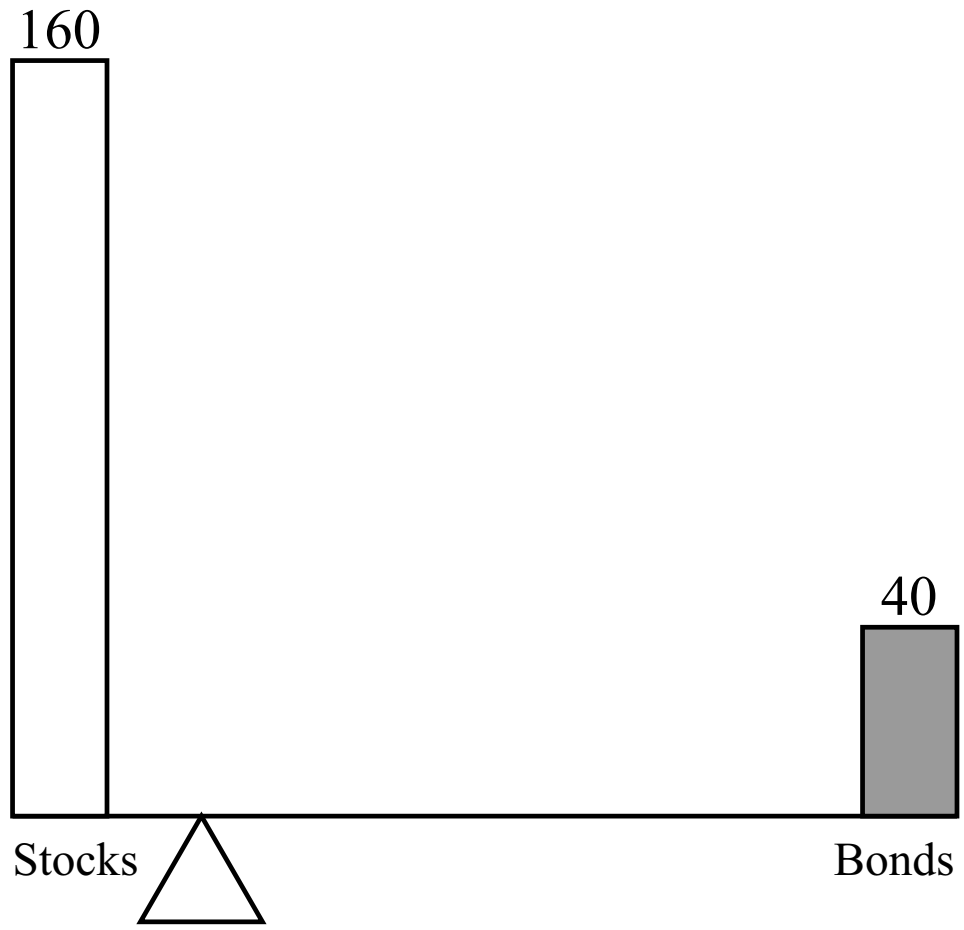


FIGURE 1.2

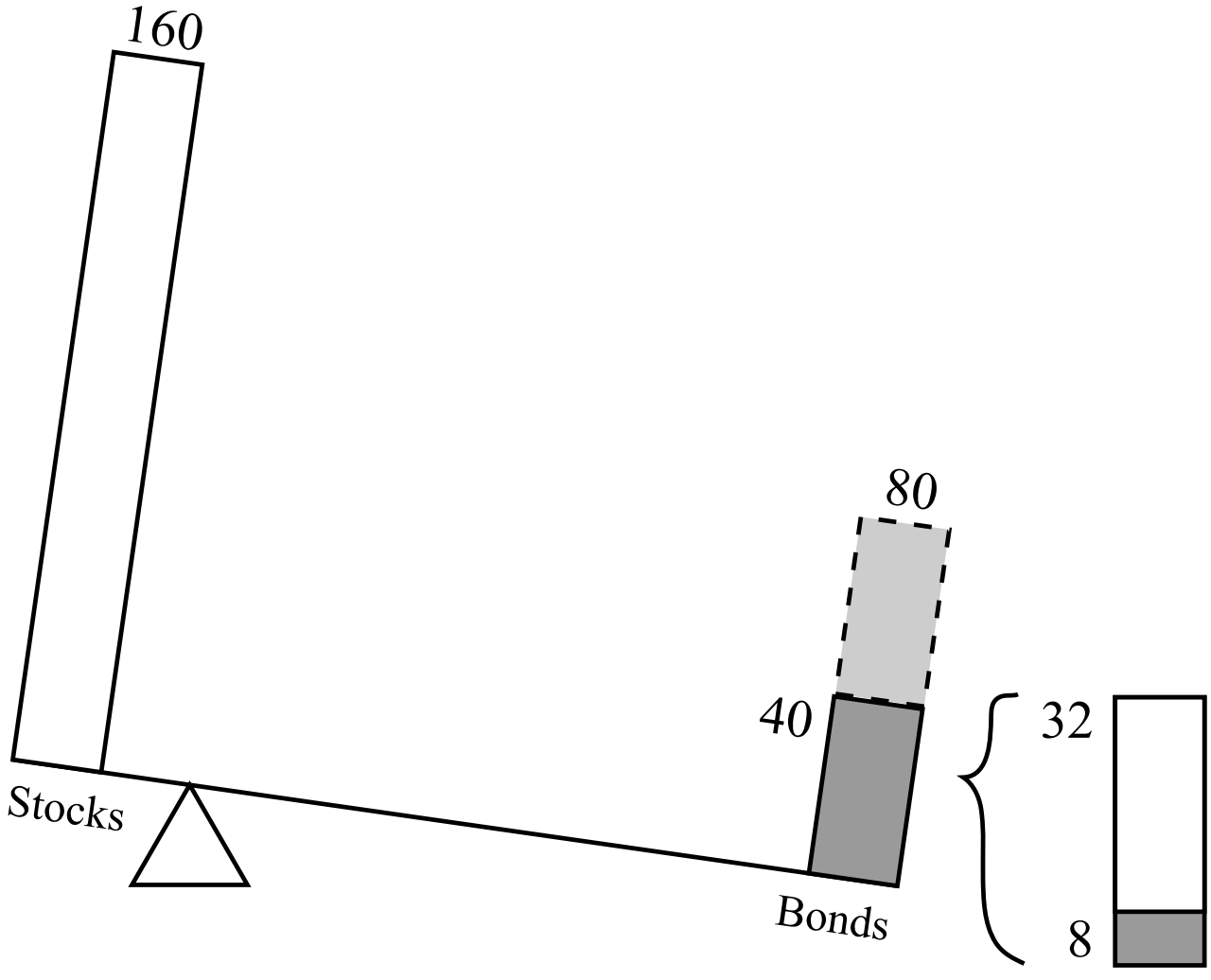
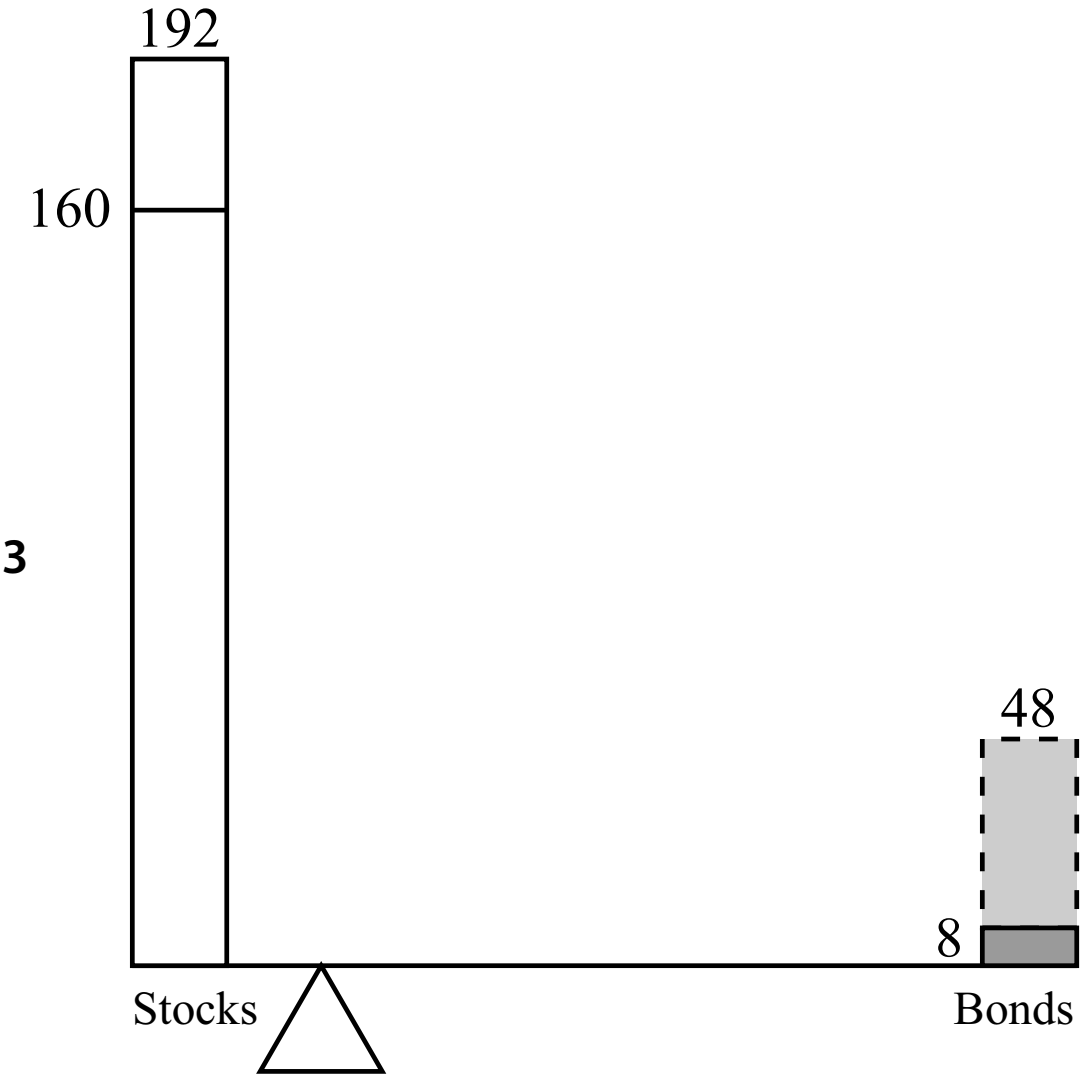


FIGURE 1.3



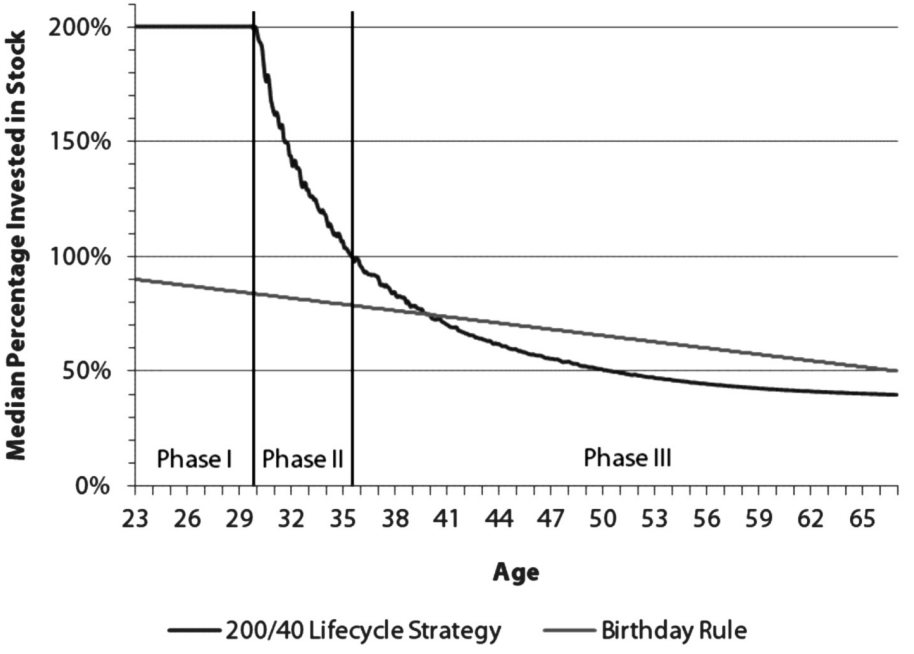


FIGURE 2.1 **Phases of Lifecycle Strategy**

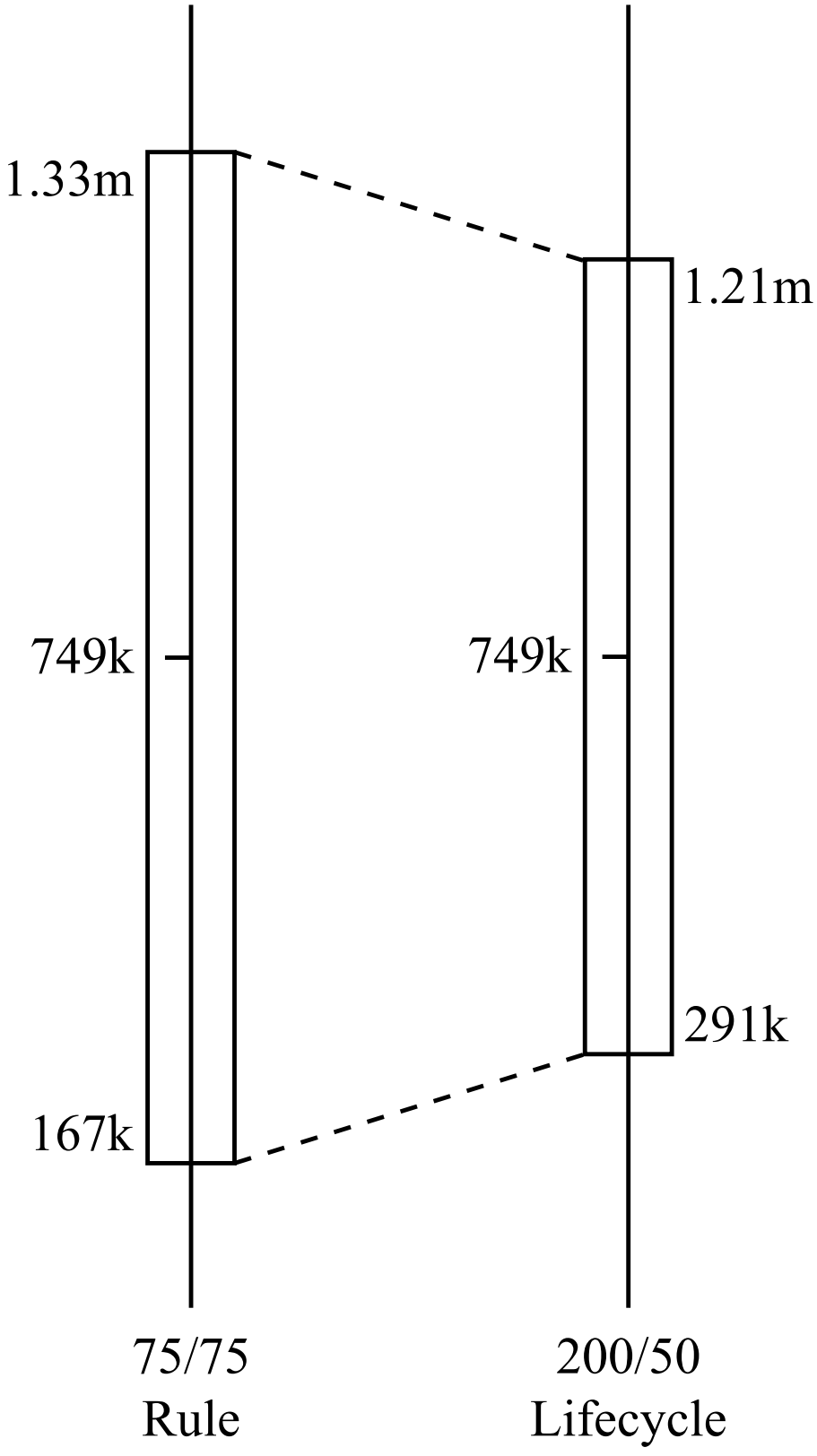


FIGURE 3.1
Same Returns with Lower Risk

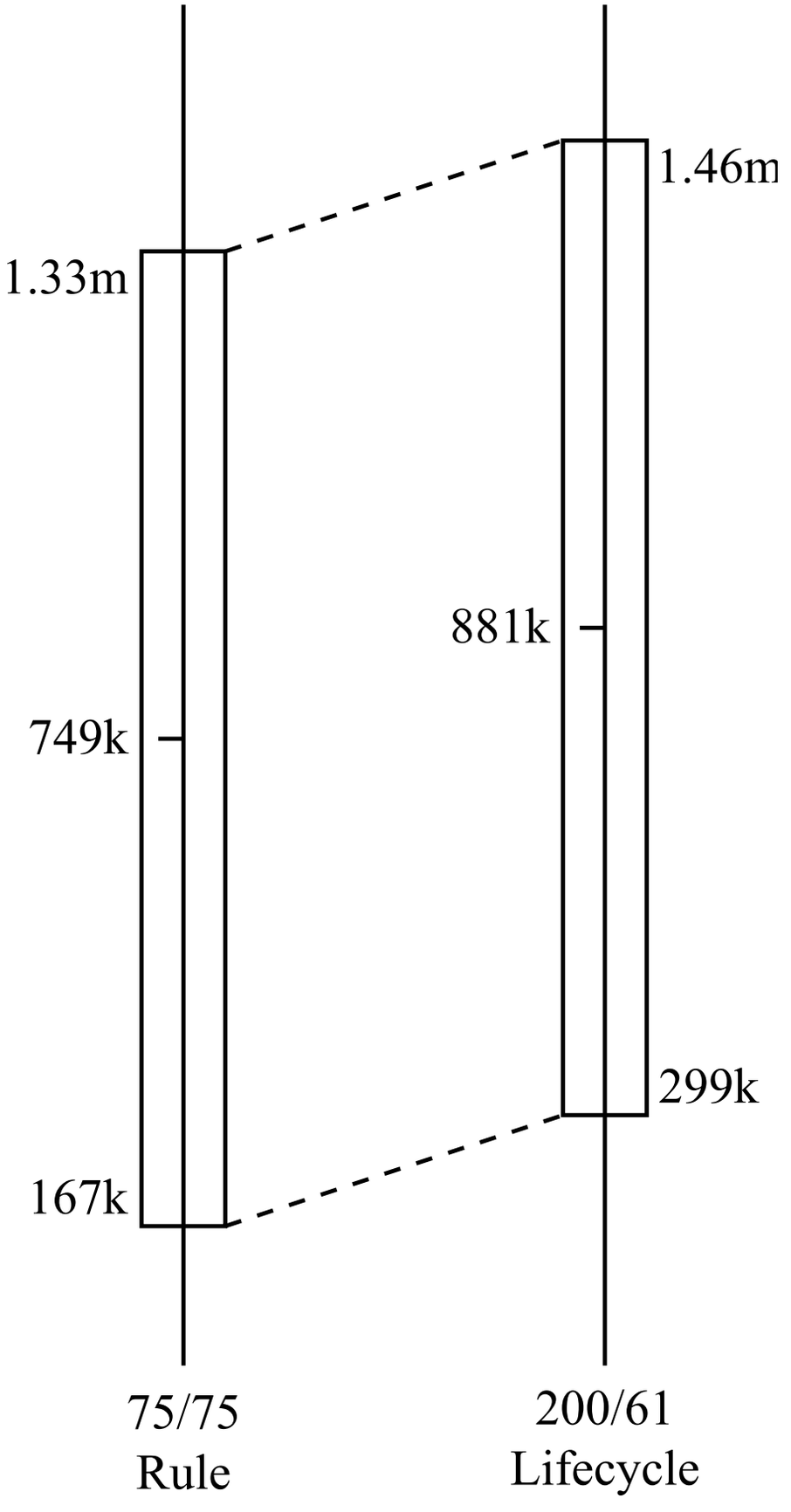


FIGURE 3.2
Same Absolute Risk with Higher Returns

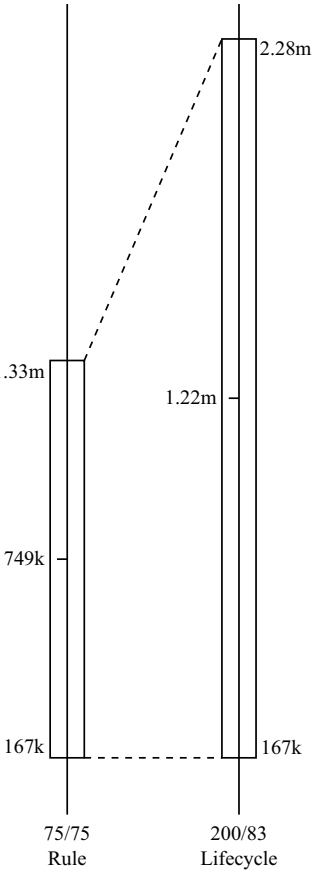


FIGURE 3.3
Same Worst Case with Higher Returns

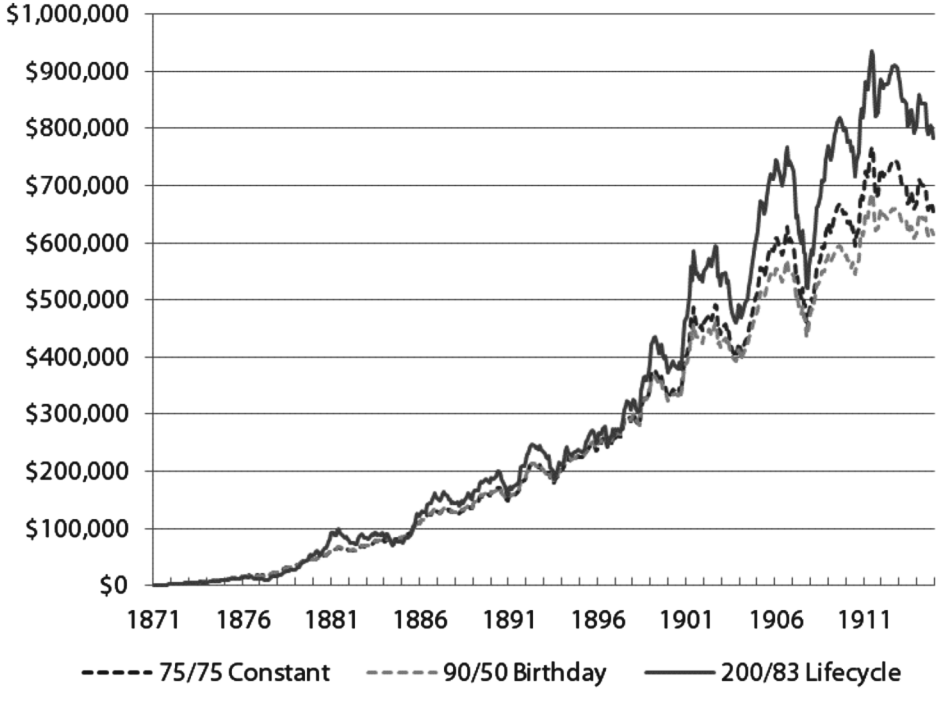


FIGURE 3.4 Zachary's Savings Under Different Strategies from 1871 to 1914

TABLE 3.1 Results from 96 Simulated Investors: 1871–2009

	Birthday Rule	*Constant % Stocks*	*Diversifying Lifecycle Strategy*	*Improvement over Birthday Rule*	*Improvement over Constant %*
Max. % Inv.	90	75	200		
Min. % Inv.	50	75	83		
Mean Result	$646,575	$748,839	$1,223,105	89.2%	63.3%
Min. Result	$290,310	$308,726	$387,172	33.4%	25.4%
10th pct.	$416,253	$449,266	$701,834	68.6%	56.2%
25th pct.	$539,343	$561,032	$884,138	63.9%	57.6%
Median	$641,555	$691,427	$1,146,812	78.8%	65.9%
75th pct.	$779,044	$922,028	$1,522,653	95.5%	65.1%
90th pct.	$870,921	$1,152,276	$1,929,577	121.6%	67.5%
Max. Result	$1,026,903	$1,252,684	$2,177,424	112.0%	73.8%

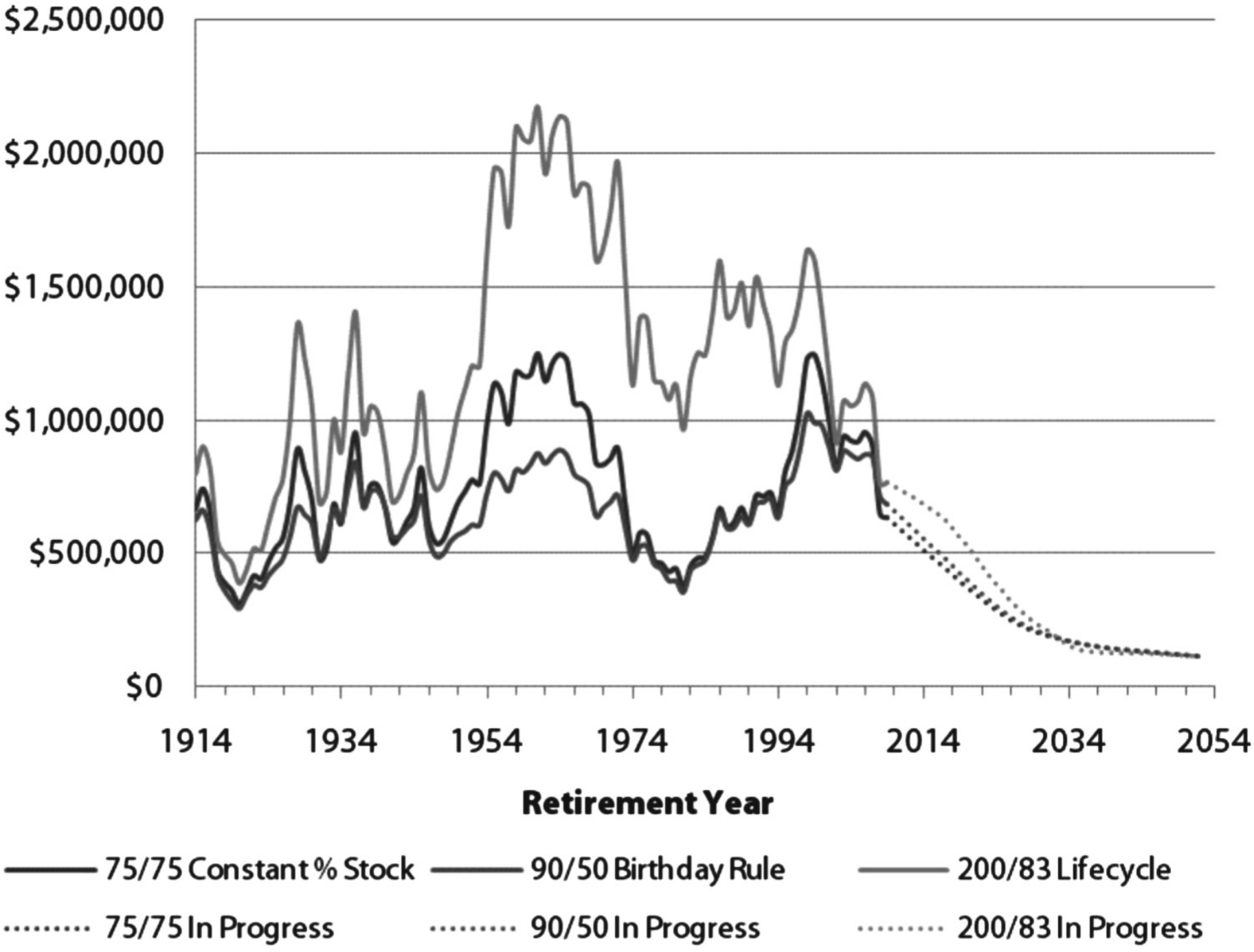


FIGURE 3.5 Comparison of Three Strategies over Historical Cohorts and Cohorts in Progress

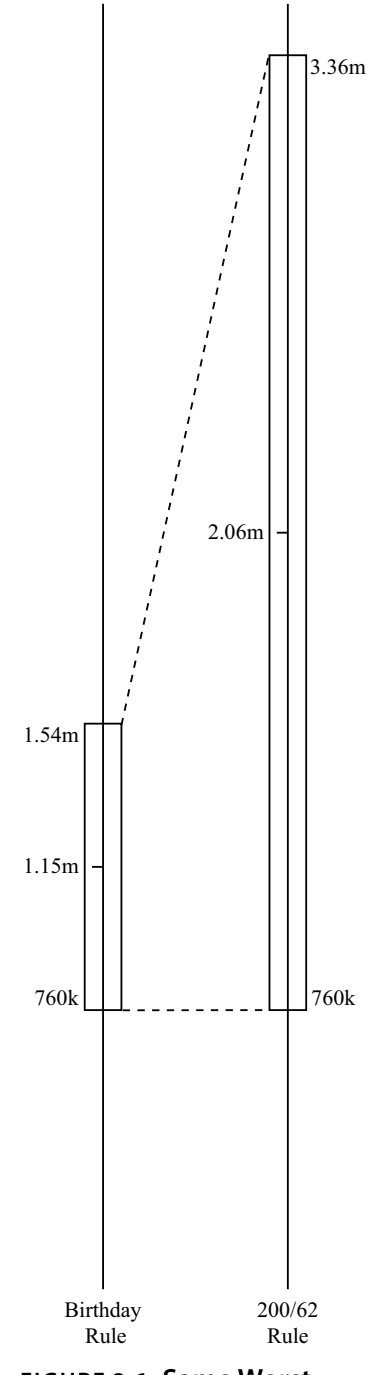


FIGURE 3.6 Same Worst Case with Higher Returns (Social Security Included)

TABLE 4.1 Extension of Lifecycle Results to Foreign Markets

	96 U.S. Cohorts (1871–2009)			30 FTSE All-Shares Cohorts (1937–2009)			17 Nikkei 225 Cohorts (1950–2009)		
	Constant % (75/75) Strategy	*Diversifying (200/83%) Strategy*	*Improvement over Constant %*	*Constant % (75/75) Strategy*	*Diversifying (200/83%) Strategy*	*Improvement over Constant %*	*Constant % (75/75) Strategy*	*Diversifying (200/83%) Strategy*	*Improvement over Constant %*
Max. % Inv.	75	200		75	200		75	200	
Min. % Inv.	75	83		75	83		75	83	
Mean Result	$748,839	$1,223,105	63.3%	£538,863	£870,619	61.6%	¥51,120,760	¥96,864,911	89.5%
Min. Result	$308,726	$387,172	25.4%	£258,337	£492,356	90.6%	¥24,626,938	¥32,181,435	30.7%
10th pct.	$449,266	$701,834	56.2%	£328,675	£637,066	93.8%	¥27,480,810	¥37,304,150	35.7%
25th pct.	$561,032	$884,138	57.6%	£457,336	£742,526	62.4%	¥33,088,478	¥47,345,900	43.1%
Median	$691,427	$1,146,812	65.9%	£546,441	£873,400	59.8%	¥42,556,445	¥62,026,139	45.8%
75th pct.	$922,028	$1,522,653	65.1%	£649,572	£1,006,454	54.9%	¥58,724,153	¥107,895,235	83.7%
90th pct.	$1,152,276	$1,929,577	67.5%	£730,990	£1,078,129	47.5%	¥89,853,314	¥207,352,643	130.8%
Max. Result	$1,252,684	$2,177,424	73.8%	£846,333	£1,203,285	42.2%	¥100,875,394	¥290,197,957	187.7%

FIGURE 4.1 Performance of the Nikkei 225 (1950–2009)

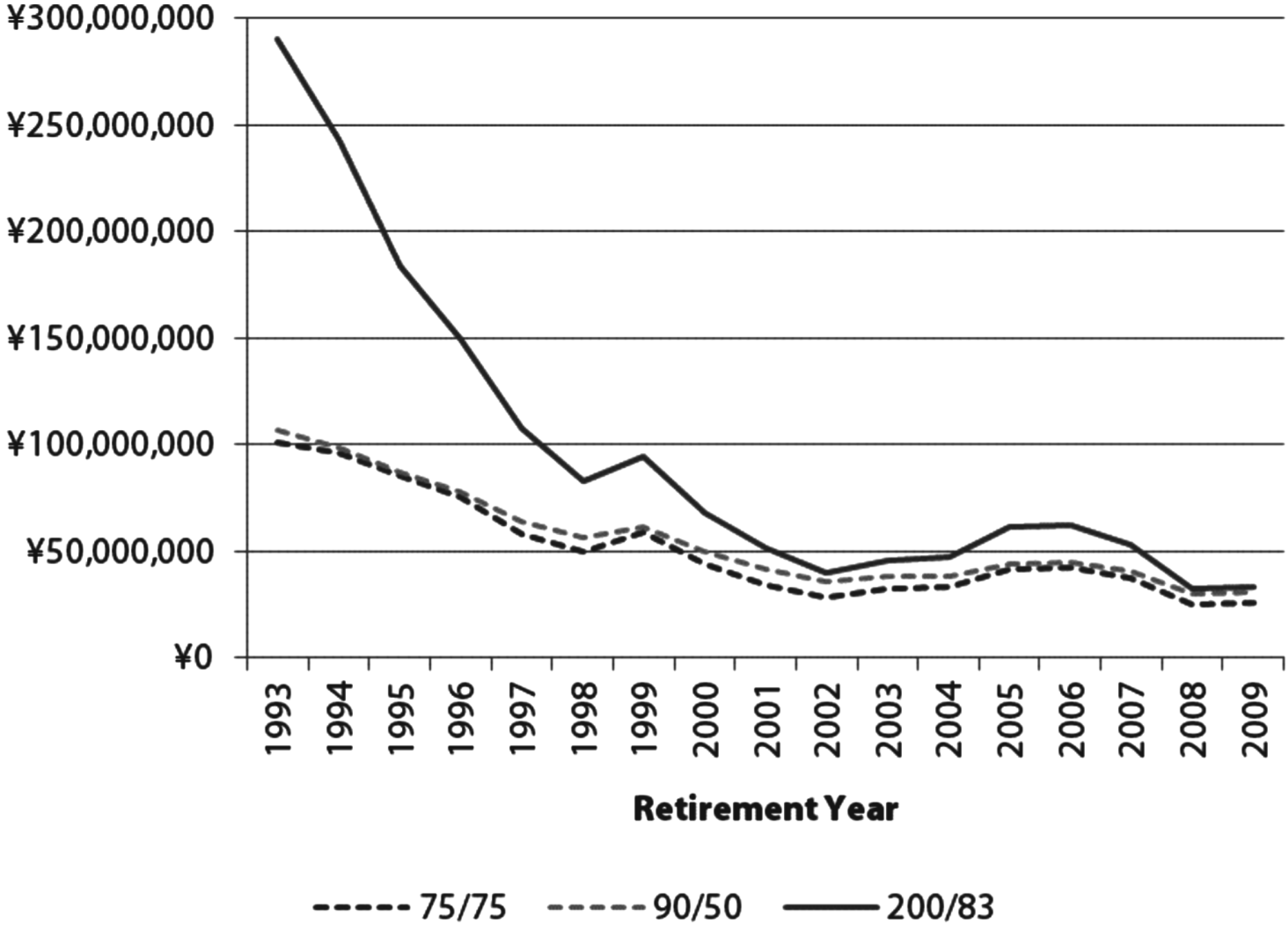


FIGURE 4.2 Final Retirement Accumulation by Retirement Year for Japanese Cohorts

TABLE 4.2 Years Spent in Each Phase of Investment

	200/83 Strategy	*200/50 Strategy*
Phase 1: Fully leveraged	12.8 years	8.3 years
Phase 2: Partially leveraged	14.2 years	7.1 years
Phase 3: Unleveraged	17.0 years	28.6 years

TABLE 4.3 Constant % Stock Strategy vs. Mean-Preserving Lifecycle 10,000 Monte Carlo Draws from a Lognormal Stock Distribution

	Constant % Stock	*Lifecycle Strategy*	*Improvement over Constant*
Max. % Inv.	50.0	200.0	
Min. % Inv.	50.0	32.1	
Mean Result	$711,746	$711,746	0.0%
St. Dev.	$320,699	$276,903	–13.7%
Min. Result	$130,575	$159,394	22.1%
10th pct.	$384,025	$412,317	7.4%
25th pct.	$490,450	$516,189	5.3%
75th pct.	$856,652	$849,440	–0.8%
90th pct.	$1,112,747	$1,067,025	–4.1%
Max. Result	$3,523,088	$3,084,903	–12.4%
Stock Distribution		Mean	6.1%
		St. Dev.	17.3%

TABLE 4.4 Constant % Stock Strategy vs. Mean-Preserving Lifecycle 10,000 Monte Carlo Draws from a Lognormal Stock Distribution with a Lower Mean

	Constant % Stock	*Lifecycle Strategy*	*Improvement over Constant*
Max. % Inv.	50.0	200.0	
Min. % Inv.	50.0	31.6	
Mean Result	$544,785	$544,785	0.0%
St. Dev.	$234,763	$204,868	–12.7%
Min. Result	$109,267	$126,532	15.8%
10th pct.	$302,382	$322,261	6.6%
25th pct.	$382,266	$399,713	4.6%
75th pct.	$652,709	$648,084	–0.7%
90th pct.	$838,548	$810,276	–3.4%
Max. Result	$2,521,100	$2,258,514	–10.4%
Stock Distribution		Mean	4.3%
		St. Dev.	17.3%

TABLE 4.5 Constant % Stock Strategy vs. Mean-Preserving Ramp Down 10,000 Monte Carlo Draws from a Lognormal Stock Distribution with Increased Volatility

	Constant % Stock	*Lifecycle Strategy*	*Improvement over Constant*
Max. % Inv.	50.0	200.0	
Min. % Inv.	50.0	33.0	
Mean	$911,087	$911,087	0.0%
St. Dev.	$668,540	$564,139	–15.6%
Min.	$80,625	$92,893	15.2%
0.1 pct.	$153,436	$169,983	10.8%
1st pct.	$209,694	$236,705	12.9%
10th pct.	$348,005	$385,503	10.8%
25th pct.	$491,757	$535,653	8.9%
75th pct.	$1,116,997	$1,122,598	0.5%
90th pct.	$1,647,642	$1,589,371	–3.5%
Max.	$9,865,224	$7,921,964	–19.7%
Stock Distribution		Mean	6.1%
		St. Dev.	25.0%

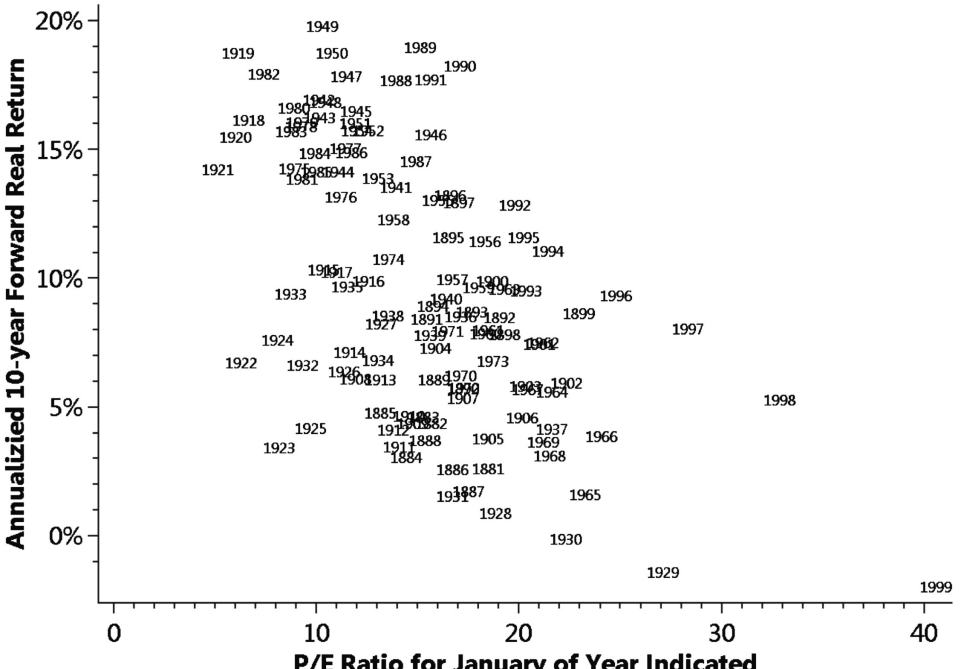


FIGURE 4.3 **Ten-Year Forward Return Compared to Market**

TABLE 4.6 Market P/E 10 and the Associated Samuelson Share

P/E 10	*Samuelson Share*
6	163%
10	118%
14	83%
18	57%
22	33%
26	12%

TABLE 4.7 Results from 86 Simulated Investors: 1881–2009

	Birthday Rule	*Constant % Stock*	*Unadjusted Lifecycle Strategy*	*Adjusted Lifecycle Strategy*	*Improvement over Birthday*	*Improvement over Constant*	*Improvement over Unadjusted*
Max. % Inv.	90	75	200	200	—	—	—
Min. % Inv.	50	75	83	0	—	—	—
Mean Result	$671,239	$771,214	$1,296,998	$1,639,374	144.2%	112.6%	26.4%
Min. Result	$351,550	$390,988	$611,774	$611,515	73.9%	56.4%	0.0%
10th pct.	$465,921	$476,942	$768,404	$903,884	94.0%	89.5%	17.6%
25th pct.	$564,012	$587,319	$1,010,702	$1,086,915	92.7%	85.1%	7.5%
Median	$670,886	$711,777	$1,204,712	$1,365,441	103.5%	91.8%	13.3%
75th pct.	$793,996	$944,026	$1,587,704	$1,963,838	147.3%	108.0%	23.7%
90th pct.	$872,311	$1,154,342	$1,939,646	$3,205,714	267.5%	177.7%	65.3%
Max. Result	$1,026,903	$1,286,285	$2,177,424	$3,522,336	243.0%	173.8%	61.8%

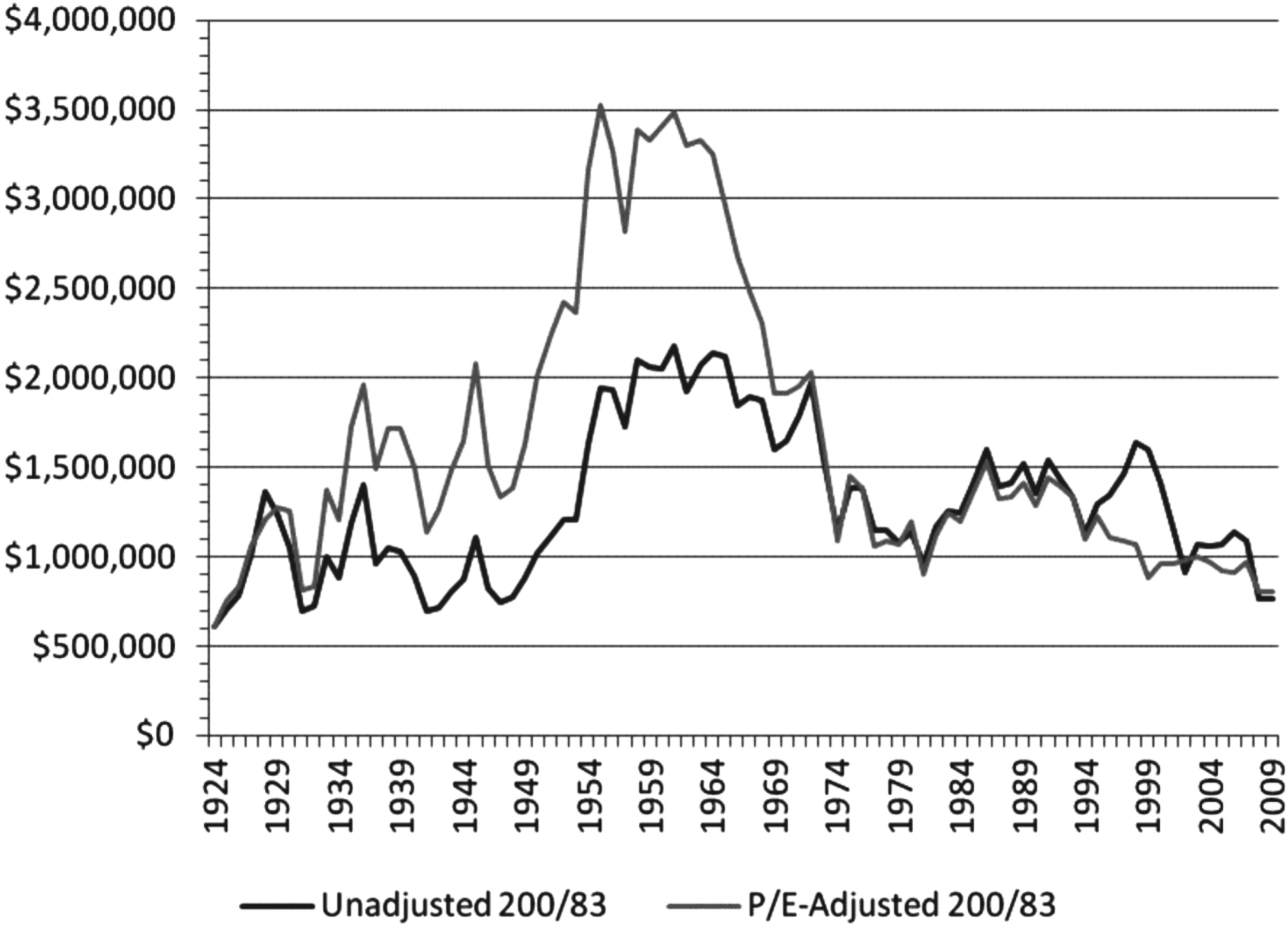


FIGURE 4.4 Final Retirement Accumulation by Year for P/E–Adjusted vs. Unadjusted Strategies

TABLE 5.1 Switching from Birthday Rule to Lifecycle Strategy Later in Work Life

	Birthday Rule	*200/83 Lifecycle Strategy*	*Improvement over Birthday*	*Switch to Lifecycle for Last 40 Years*	*Improvement over Birthday*	*Switch to Lifecycle for Last 35 Years*	*Improvement over Birthday*
Mean Result	$646,575	$1,223,105	89.2%	$1,200,075	85.6%	$1,128,916	74.6%
Min. Result	$290,310	$387,172	33.4%	$355,710	22.5%	$368,754	27.0%
10th pct.	$416,253	$701,834	68.6%	$696,726	67.4%	$719,691	72.9%
25th pct.	$539,343	$884,138	63.9%	$869,564	61.2%	$825,371	53.0%
Median	$641,555	$1,146,812	78.8%	$1,139,359	77.6%	$1,064,119	65.9%
75th pct.	$779,044	$1,522,653	95.5%	$1,443,402	85.3%	$1,381,705	77.4%
90th pct.	$870,921	$1,929,577	121.6%	$1,887,323	116.7%	$1,771,132	103.4%
Max. Result	$1,026,903	$2,177,424	112.0%	$2,237,399	117.9%	$2,378,396	131.6%
Avg. % Inv. at Switch		200		200		200	

		Switch to Lifecycle for Last 30 Years	*Improvement over Birthday*	*Switch to Lifecycle for Last 25 Years*	*Improvement over Birthday*	*Switch to Lifecycle for Last 20 Years*	*Improvement over Birthday*
Mean Result		$1,044,939	61.6%	$972,221	50.4%	$898,173	38.9%
Min. Result		$388,864	34.0%	$399,330	37.6%	$336,199	15.8%
10th pct.		$635,924	52.8%	$563,407	35.4%	$497,530	19.5%
25th pct.		$778,659	44.4%	$676,065	25.4%	$591,064	9.6%

Median		$909,276	41.7%	$797,963	24.4%	$811,275	26.5%
75th pct.		$1,180,967	51.6%	$1,175,825	50.9%	$1,086,152	39.4%
90th pct.		$1,676,114	92.5%	$1,691,259	94.2%	$1,541,586	77.0%
Max. Result		$2,338,557	127.7%	$2,129,773	107.4%	$1,943,502	89.3%
Avg. % Inv. at Switch		191		152		121	

		Switch to Lifecycle for Last 15 Years	*Improvement over Birthday*	*Switch to Lifecycle for Last 10 Years*	*Improvement over Birthday*	*Switch to Lifecycle for Last 5 Years*	*Improvement over Birthday*
Mean Result		$825,553	27.7%	$755,535	16.9%	$698,956	8.1%
Min. Result		$299,142	3.0%	$296,963	2.3%	$287,949	–0.8%
10th pct.		$454,665	9.2%	$431,217	3.6%	$418,161	0.5%
25th pct.		$571,529	6.0%	$564,212	4.6%	$525,010	–2.7%
Median		$751,761	17.2%	$712,307	11.0%	$679,321	5.9%
75th pct.		$989,416	27.0%	$917,150	17.7%	$848,698	8.9%
90th pct.		$1,406,078	61.5%	$1,200,602	37.9%	$996,685	14.4%
Max. Result		$1,592,337	55.1%	$1,359,755	32.4%	$1,291,251	25.7%
Avg. % Inv. at Switch		103		92		86	

TABLE 5.2 Impact of $500, $1,000, and $5,000 Inheritance Invested at 200% Stock, 100% Stock, and 100% Bonds from Birth to Age 22 and Following a Diversifying 200/83 Strategy Thereafter

	$500 Inheritance at 100% Bonds	*$500 Inheritance at 100% Stock*	*Improvement over 100% Bonds*	*$500 Inheritance at 200% Stock*	*Improvement over 100% Bonds*
Mean Result	$1,378,031	$1,410,573	2.4%	$1,490,899	8.2%
Min. Result	$727,570	$736,572	1.2%	$733,416	0.8%
10th pct.	$844,958	$859,045	1.7%	$939,261	11.2%
25th pct.	$1,087,263	$1,106,721	1.8%	$1,161,063	6.8%
Median	$1,327,069	$1,352,427	1.9%	$1,457,633	9.8%
75th pct.	$1,655,024	$1,729,245	4.5%	$1,803,963	9.0%
90th pct.	$1,968,761	$1,981,700	0.7%	$2,167,269	10.1%
Max. Result	$2,220,573	$2,265,918	2.0%	$2,991,801	34.7%
	$1,000 Inheritance at 100% Bonds	*$1,000 Inheritance at 100% Stock*	*Improvement over 100% Bonds*	*$1,000 Inheritance at 200% Stock*	*Improvement over 100% Bonds*
Mean Result	$1,400,825	$1,464,596	4.6%	$1,620,486	15.7%
Min. Result	$760,323	$773,853	1.8%	$769,655	1.2%
10th pct.	$859,708	$904,163	5.2%	$994,446	15.7%
25th pct.	$1,089,626	$1,152,625	5.8%	$1,183,069	8.6%
Median	$1,360,025	$1,424,139	4.7%	$1,552,222	14.1%
75th pct.	$1,659,814	$1,802,864	8.6%	$1,949,127	17.4%
90th pct.	$1,976,648	$2,039,670	3.2%	$2,297,024	16.2%
Max. Result	$2,256,302	$2,345,004	3.9%	$3,902,278	73.0%
	$5,000 Inheritance at 100% Bonds	*$5,000 Inheritance at 100% Stock*	*Improvement over 100% Bonds*	*$5,000 Inheritance at 200% Stock*	*Improvement over 100% Bonds*
Mean Result	$1,568,369	$1,852,215	18.1%	$2,445,979	56.0%
Min. Result	$776,811	$913,078	17.5%	$889,470	14.5%
10th pct.	$974,506	$1,133,555	16.3%	$1,240,896	27.3%
25th pct.	$1,177,094	$1,419,360	20.6%	$1,473,687	25.2%
Median	$1,570,632	$1,705,009	8.6%	$2,086,440	32.8%
75th pct.	$1,911,256	$2,284,061	19.5%	$2,768,188	44.8%
90th pct.	$2,220,743	$2,597,872	17.0%	$4,688,804	111.1%
Max. Result	$2,514,668	$3,237,877	28.8%	$9,945,576	295.5%

FIGURE 5.1 Optimal Stock Allocation by Age from Gomes, Kotlikoff, and Viceira

TABLE 5.3 Endowments (in Billions)

	2008 Endowment Value	*2008 Contributions and Pledges*	*Present Value of Future Contributions and Pledges**	*2008 Present & Future Endowment*	*% Increase*	*Stock Allocation (50% Target)*	*Stock Allocation (83% Target)*
Ford	$10.87	$0.00	$0.00	$10.87	0.0	50.0%	83.0%
Rockefeller**	$4.10	$0.00	$0.00	$4.10	0.0	50.0%	83.0%
MIT	$10.07	$0.39	$15.08	$25.15	149.7	124.9%	219.8%
Yale	$22.87	$0.37	$14.45	$37.32	63.2	81.6%	143.6%

*Assumed annual risk-free interest rate of 2.56%.

**2008 endowment value was unavailable for Rockefeller; $4.1 billion is the 2007 value.

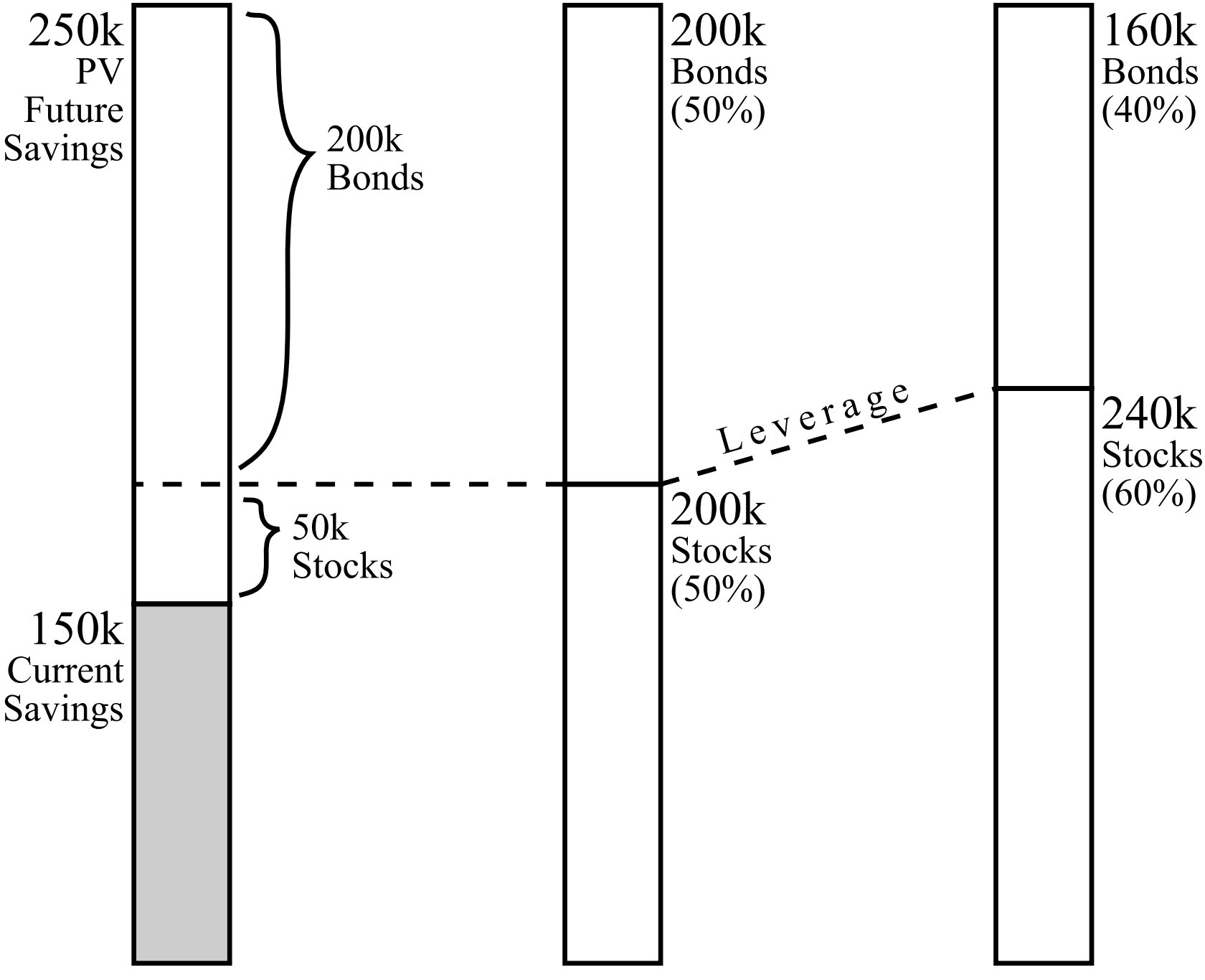


FIGURE 6.1 Adjusting Leverage for Human Capital

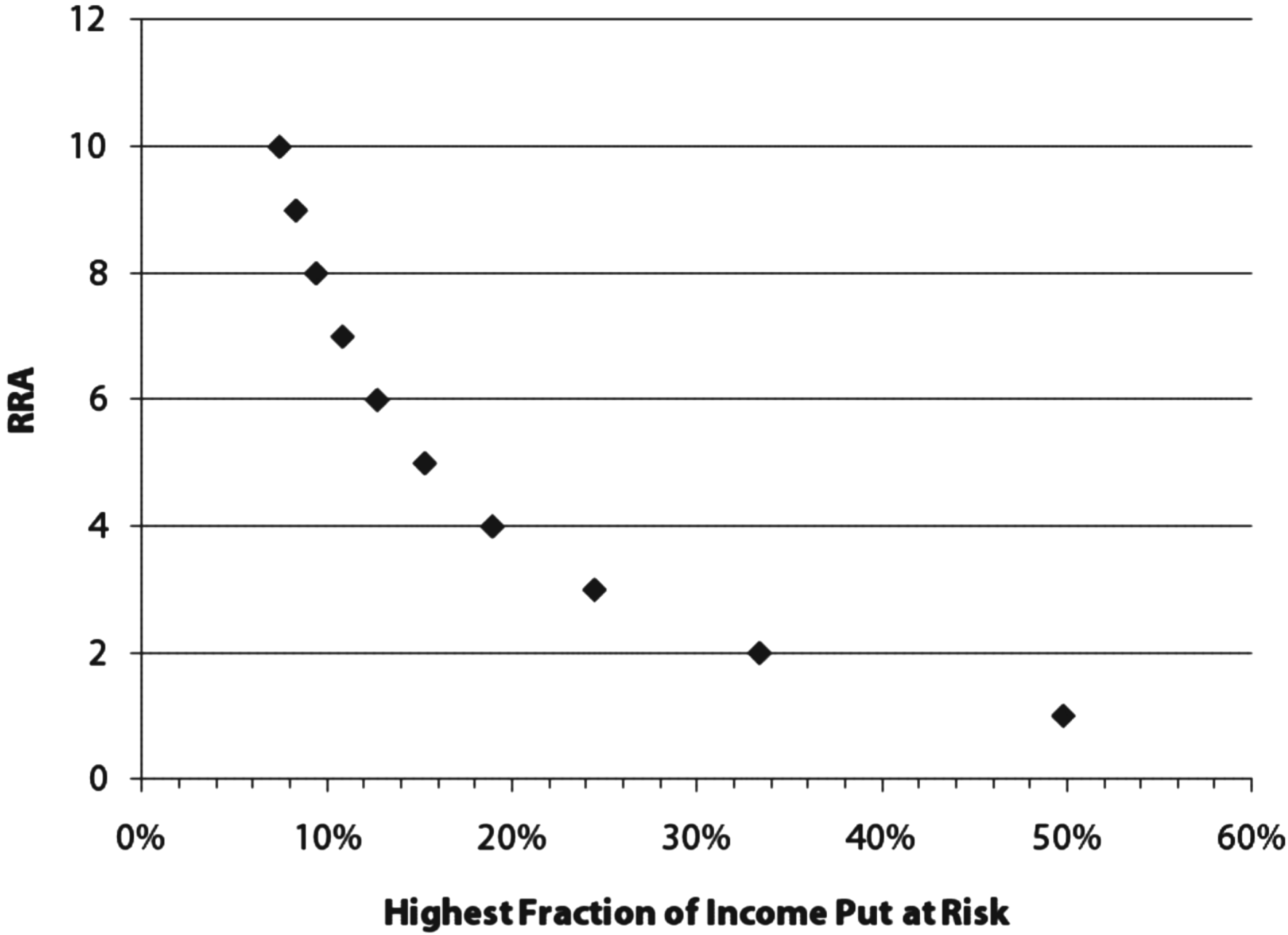


FIGURE 7.1 RRA as a Function of Willingness to Put Income at Risk

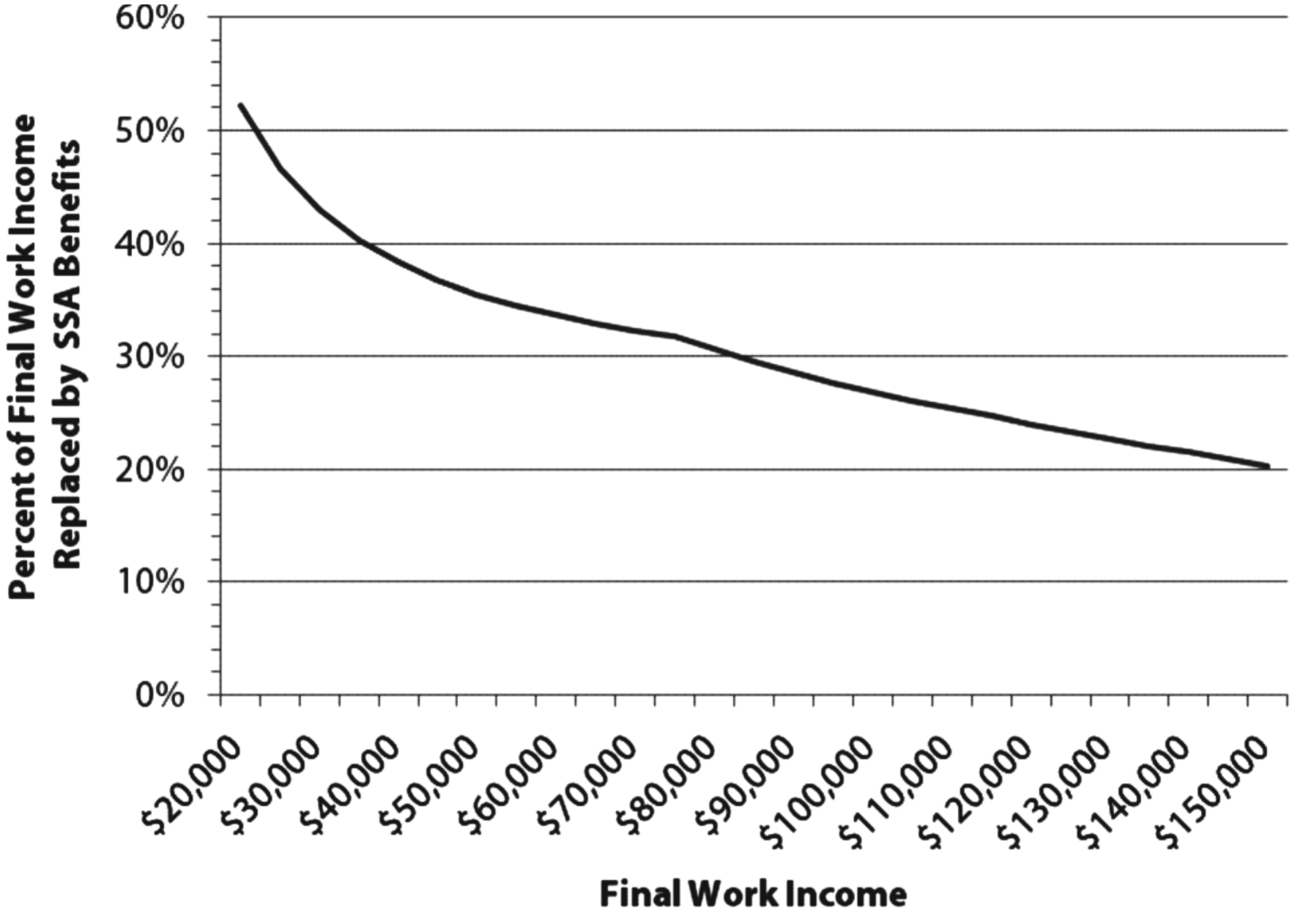


FIGURE 7.2 **Social Security Benefits as a Percentage of Final Income**

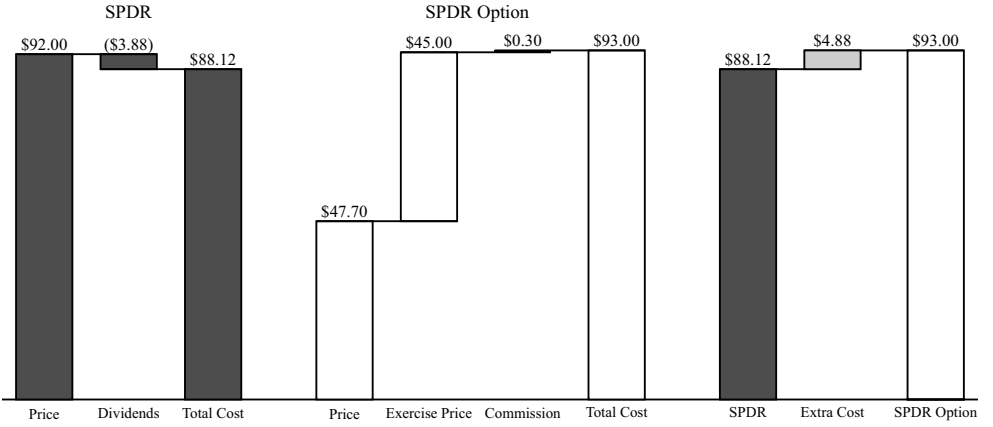


FIGURE 8.1 Andrew's Implied Cost of Borrowing

A corrected version of this figure is available here.