

# Why Invest in Bonds!

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## Abstract

Typically financial planners advise investors to diversify, invest some of your money in bonds and some of your money in common stock. Is this sound advice?

This paper examines thirty-five different holding periods and compares the return on large company common stock portfolios to the returns on long-term corporate bond portfolios. Each of the holding periods is thirty years long. The first holding period is 1940 through 1969, the second holding period is 1941 through 1970. The last holding period is 1974 through 2003.



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## **Introduction**

Research and conventional wisdom occasionally intersect in the world of finance. When investing for long periods of time (e.g. retirement saving for at least thirty years), conventional wisdom holds that the investor's total return will be greater when the investment is made in a diversified equity (stock) portfolio than when the investment is made in a diversified debt (bond) portfolio. Total return is defined as capital appreciation/depreciation plus interest and/or dividends. Research has repeatedly supported this conventional wisdom axiom. (Keown)

Despite the preponderance of evidence supporting superior returns from stocks, many long-term investors have portfolios which hold a portion of the funds in bonds. An aversion to risk is commonly given as the reason for the flight to bonds, with investors citing the fact that stocks are generally regarded as riskier than bonds. Behind this risk aversion is often a fear that the stock market's superior performance is an unsustainable passing anomaly or it may be based upon a belief that a future large stock market downward correction will wipe out any gains garnered during the investment period. Although prudent investing is always advised, such an aversion to long-term investing in the stock market is unwarranted.

How then could a cautious long-term investor get comfortable with buying only stock mutual funds or index funds? Such an investor will likely find a comparison of historic stock and bond returns done for a single period of time of little comfort. Put another way, a historic comparison of 30-year returns on stocks and bonds for a period ending in 2004 is not enough. Cautious investors today have invested for both short and long time periods. An investor who is 40 years old may have been actively investing for 10 years while an investor who is 60 years old may have been investing for 30 years. Is it likely that the 40-year old stock investor will lose money while the 60-year old makes money because of some future stock market correction or because they began investing at different points in time?

A study evaluating the merits of investing in the stocks funds versus the bond funds must therefore address two concerns. First, the study must show that the stock market's superior returns are not a passing anomaly and that long term investors should see superior returns in the stock market regardless of when they begin investing. Second, the study must show that if a large downward correction does occur and the stock portfolio does decline in value, the investor is better off after the large decrease in equity value when compared to the value of the portfolio had the investment been only in a bond portfolio.

## **Long-term Investment Analysis Methodology**

In order to test the superiority of long-term stock investment over long-term bond investment, a representative stock portfolio and representative bond portfolio are evaluated. For these portfolios, the Large Company Stock portfolio was chosen for equities. For bonds the Long-term Corporate Bond portfolio was selected.<sup>1</sup> Both portfolios were constructed by Ibbotson Associates. (Ibbotson) The Ibbotson Large Company Stock portfolio is derived from the Standard and Poor's 500 stock Composite Index. The Ibbotson Long-term Corporate Bond

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<sup>1</sup> See Appendix for annual returns.

portfolio is derived from the Salomon Brothers long-term, high-grade corporate bond total return index.

The Standard and Poor's 500 stock Composite Index is made up of the 500 most widely held companies--chosen with respect to market size, liquidity, and industrial sector. (Investopedia) It includes 500 stocks which represent the industrial, financial, utility, and transportation sectors of the equity market. This index is commonly used by institutional investors as a proxy for the equity market. (Morningstar)

The Salomon Brothers long-term, high-grade corporate bond total return index is made up of AAA and AA investment grade corporate bonds with maturities greater than 12 years. (Morningstar) An obligation rated 'AAA' has the highest rating assigned by Standard & Poor's. The obligor's capacity to meet its financial commitment on the obligation is extremely strong. An obligation rated 'AA' differs from the highest-rated obligations only to a small degree. The obligor's capacity to meet its financial commitment on the obligation is very strong. (Standard & Poor's)

A long-term investing strategy is one that involves consistent investment over a long period of time. To replicate such a strategy, two models were constructed which calculate the total dollar amount in bond and equity portfolios at the end of 30 years if \$1,000 is invested on the first day of each year in the investment period. As an example, the equity model calculates the return on the portfolio each year using the actual historical return from the Ibbotson Large Company Stock data for that year multiplied by the total portfolio value. It then reinvests the return in the portfolio at the end of the year. The portfolio thus is increased each year by the \$1,000 investment and increased or decreased by the positive or negative return in that year specified in the Ibbotson Large Company Stock data. The bond portfolio is modeled the same way, only the Ibbotson Long-term Corporate Bond return is used.

To assuage fears that comparison of stock and bond investment returns for a single 30 year period of time is not meaningful, the stock and bond models were run for 35 different 30-year periods. The first modeled period covered the period of January 1, 1940 through December 31, 1969. The second 30 year period began January 1, 1941 and ended December 31, 1970. The models were then run for each available 30-year period. The last modeled period began January 1, 1974 and ended December 31, 2003.

The model computes the average<sup>2</sup> returns for each of the 35 year investment periods for both the stock portfolios and the bond portfolios. The percentage returns are found in Table 1 as Average Annual Equity Return and Average Annual Debt Return. Table 1 also presents the annual percentage difference in the two returns.

Table 2 presents the dollar value of the portfolios. Table 2 also presents the "equity advantage" for each of the 35 investment periods. The equity advantage is the difference in dollars between the equity fund and the bond fund for each 30 year holding period. The table presents all 35 holding periods.

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<sup>2</sup> Average in this case technically refers to the geometric mean.



## Results

In each of the 35 observations, recall that each observation covers 30 years, the average annual equity return exceeded the average annual debt return, see Table 1. The period of 1940-1969 yielded the greatest difference between annual equity and debt returns (11.92%) while the period of 1973-2002 yielded the smallest difference between annual equity and debt returns (2.09%). The average difference between annual equity and debt returns for the 35 observations modeled was 5.10%.

Table 1

Investment Period	Average Annual Equity Return	Average Annual Debt Return	Difference In Annual Return
1940-1969	13.33%	1.41%	11.92%
1941-1970	13.03%	2.37%	10.67%
1942-1971	13.10%	2.88%	10.22%
1943-1972	13.19%	3.16%	10.03%
1944-1973	11.77%	3.08%	8.69%
1945-1974	9.24%	2.74%	6.50%
1946-1975	10.23%	3.44%	6.79%
1947-1976	10.79%	4.32%	6.47%
1948-1977	9.69%	4.26%	5.43%
1949-1978	9.26%	4.09%	5.17%
1950-1979	9.32%	3.66%	5.66%
1951-1980	9.98%	3.33%	6.65%
1952-1981	8.97%	3.10%	5.87%
1953-1982	9.34%	5.05%	4.29%
1954-1983	9.79%	5.21%	4.58%
1955-1984	9.37%	5.91%	3.46%
1956-1985	10.32%	5.89%	4.43%
1957-1986	10.77%	7.98%	2.79%
1958-1987	10.58%	7.62%	2.96%
1959-1988	10.83%	8.04%	2.79%
1960-1989	11.83%	8.60%	3.23%
1961-1990	11.25%	8.67%	2.58%
1962-1991	12.19%	9.38%	2.81%
1963-1992	12.19%	9.59%	2.60%
1964-1993	12.23%	9.98%	2.25%
1965-1994	11.90%	9.39%	2.51%
1966-1995	13.16%	10.39%	2.77%
1967-1996	13.87%	10.17%	3.70%
1968-1997	14.91%	10.50%	4.41%

1969-1998	15.81%	10.69%	5.12%
1970-1999	16.41%	9.91%	6.50%
1971-2000	15.51%	10.11%	5.40%
1972-2001	14.43%	10.24%	4.19%
1973-2002	12.74%	10.65%	2.09%
1974-2003	13.49%	10.53%	2.96%
35 Period Average	11.85%	6.75%	5.10%

The model also calculated what the nominal portfolio values would be for both debt and equity portfolios at the end of each of the 35 observations, see Table 2. As would be expected, equity portfolio balances were greater than debt portfolio balances at the end of each of the 35 observations.

Table 2

Investment Period	Equity Portfolio Balance	Debt Portfolio Balance	Portfolio Difference "Equity Advantage"
1940-1969	312,692	37,018	275,674
1941-1970	295,159	42,985	252,174
1942-1971	299,119	46,663	252,456
1943-1972	304,031	48,862	255,169
1944-1973	230,895	48,216	182,679
1945-1974	142,509	45,596	96,913
1946-1975	171,720	51,118	120,602
1947-1976	191,048	59,216	131,832
1948-1977	155,188	58,625	96,563
1949-1978	143,179	56,901	86,278
1950-1979	144,657	53,012	91,645
1951-1980	163,775	50,199	113,576
1952-1981	135,672	48,317	87,355
1953-1982	145,364	67,016	78,348
1954-1983	158,022	68,895	89,127
1955-1984	146,142	77,862	68,280
1956-1985	143,297	77,599	65,698
1957-1986	190,305	112,885	77,420
1958-1987	183,714	107,562	76,152
1959-1988	192,728	114,053	78,675
1960-1989	233,603	126,445	107,158
1961-1990	208,892	128,235	80,657
1962-1991	250,268	146,310	103,958
1963-1992	250,392	152,136	98,256
1964-1993	252,224	163,891	88,333

1965-1994	236,509	146,685	89,824
1966-1995	302,774	177,282	125,492
1967-1996	347,988	170,007	177,981
1968-1997	427,055	181,011	246,044
1969-1998	510,615	187,448	323,167
1970-1999	575,906	161,643	414,263
1971-2000	481,286	167,898	313,388
1972-2001	388,506	172,231	216,275
1973-2002	278,562	186,163	92,399
1974-2003	332,901	181,954	150,947
35 Period Average	255,049	106,341	148,708

### Downward Correction Analysis Methodology

In the prior analysis a comparison was made of equity returns and debt returns over successive 30 year holding periods. The equity returns were superior. Still some investors shy away from equities because of a fear that superior past equity performance could be wiped out by a large downward stock market correction. Put another way, these investors invest in the bond market and give up the opportunity for a superior equity return in exchange for less exposure to stock market volatility.

To evaluate the risk of loss to equity investors due to large downward stock market corrections, Table 3 was prepared. It uses data calculated in Table 1 to prepare hypothetical equity and debt portfolios. Table 1 presents the average 30-year annual equity and debt portfolio returns to be 11.85% and 6.75% respectively. Table 3 calculates annual portfolio balances for both equity and debt portfolios assuming \$1,000 annual investments and constant equity and bond return rates. The equity model calculates the return on the portfolio each year using the Average Annual Equity Return (11.85%) from Table 1 multiplied by the total portfolio value. It then reinvests the return in the portfolio at the end of the year. The portfolio thus is increased each year by the \$1,000 investment and increased by the Average Annual Equity Return from Table 1. The bond portfolio is modeled the same way, only the Average Annual Debt Return (6.75%) from Table 1 is used.

Using the data in columns 1 and 2 in Table 3, and holding the debt returns constant, it is possible to model how large an equity market correction would have to be during any given year in the investment period such that it would cause the equity portfolios performance to equal the performance of the debt portfolio over the 30-year investing period. Stated differently, the model calculates what percent the equity portfolio would have to decrease during the year such that the equity portfolio could recover (with \$1,000 annual investments and growing at 11.85% annually) and yield a return equal the bond portfolio return during the 30-year investment period. This percent of stock market decline is labeled "Breakeven Equity Reduction Percent" in Table 3.

Table 3

Investment Year	Equity Portfolio Balance (11.85% Return)	Debt Portfolio Balance (6.75 % Return)	Breakeven Equity Reduction Percent
Year 1	1,119	1,068	****
Year 2	2,370	2,207	****
Year 3	3,769	3,424	****
Year 4	5,334	4,722	****
Year 5	7,085	6,108	****
Year 6	9,043	7,588	****
Year 7	11,233	9,168	****
Year 8	13,682	10,854	****
Year 9	16,422	12,654	95.65%
Year 10	19,486	14,576	89.48%
Year 11	22,914	16,627	84.54%
Year 12	26,748	18,817	80.50%
Year 13	31,036	21,155	77.18%
Year 14	35,832	23,650	74.40%
Year 15	41,197	26,314	72.06%
Year 16	47,197	29,158	70.07%
Year 17	53,909	32,194	68.37%
Year 18	61,415	35,434	66.91%
Year 19	69,812	38,894	65.64%
Year 20	79,203	42,586	64.55%
Year 21	89,707	46,528	63.60%
Year 22	101,456	50,737	62.77%
Year 23	114,597	55,229	62.04%
Year 24	129,295	60,024	61.40%
Year 25	145,735	65,143	60.84%
Year 26	164,123	70,608	60.34%
Year 27	184,690	76,442	59.90%
Year 28	207,694	82,669	59.52%
Year 29	233,424	89,317	59.18%
Year 30	262,203	96,413	58.87%

\*\*\*\* The equity portfolio could lose 100% of value at this point in time and the balance in the 30-year equity portfolio would still exceed the balance in the 30-year debt portfolio.

## Results

During the first eight years of the 30-year investment period, the equity portfolio could lose 100% of its value and if the investor continues to invest \$1,000 per year and the portfolio earns

an annual return of 11.85%, the equity portfolio will still out perform the debt portfolio. During year nine the equity portfolio could lose 95.65% and the debt and equity portfolios would be equal at the end of 30 years. This percent declines each year until in the 30th year, the equity portfolio could lose 58.87% and the portfolios would be equal.

Another way to examine the desirability of the equity portfolio is compare the ending values of the equity and debt portfolios for each holding period. For the investment period 1940 through 1969 the terminal values of the equity and debt portfolios were \$312,692 and \$37,018 respectively. For the investor to be indifferent between the two portfolios the equity portfolio would have to lose \$275,665 or 88.16% of the portfolio value during the last year for the two portfolios to be equal at the end of the holding period. Table 4 presents the data.

For the 30 year holding period ending in 2003, the equity and debt portfolios were valued at \$322,901 and \$181,956 respectively. If the two portfolios were to have the same value at the end of 2003 the equity portfolio would have to decline by \$140,845 or 43.65% in the last year.

Table 4

Investment Holding Period	Equity Portfolio Balance	Debt Portfolio Balance	Portfolio Difference "Equity Advantage"	% Loss To Equalize Portfolios
1940-1969	312,683	37,018	275,665	88.16%
1941-1970	295,159	42,985	252,174	85.44%
1942-1971	299,119	46,663	252,456	84.40%
1943-1972	304,031	48,862	255,169	83.93%
1944-1973	230,895	48,216	182,679	79.12%
1945-1974	142,509	45,600	96,909	68.00%
1946-1975	171,720	51,123	120,597	70.23%
1947-1976	191,048	59,222	131,826	69.00%
1948-1977	155,188	58,630	96,558	62.22%
1949-1978	143,179	56,906	86,273	60.26%
1950-1979	144,657	53,017	91,640	63.35%
1951-1980	163,775	50,203	113,572	69.35%
1952-1981	135,672	48,322	87,350	64.38%
1953-1982	145,364	67,021	78,343	53.89%
1954-1983	158,022	68,901	89,121	56.40%
1955-1984	146,142	77,868	68,274	46.72%
1956-1985	174,676	77,605	97,071	55.57%
1957-1986	190,305	112,894	77,411	40.68%
1958-1987	183,714	105,750	77,964	42.44%
1959-1988	192,728	114,061	78,667	40.82%
1960-1989	233,603	126,454	107,149	45.87%
1961-1990	208,892	128,243	80,649	38.61%
1962-1991	250,268	146,319	103,949	41.54%
1963-1992	250,392	152,145	98,247	39.24%
1964-1993	252,224	163,901	88,323	35.02%
1965-1994	236,510	146,693	89,817	37.98%
1966-1995	302,774	177,291	125,483	41.44%
1967-1996	347,987	170,016	177,971	51.14%
1968-1997	427,055	181,020	246,035	57.61%
1969-1998	510,615	187,456	323,159	63.29%
1970-1999	575,906	161,649	414,257	71.93%
1971-2000	481,286	167,903	313,383	65.11%
1972-2001	388,506	172,235	216,271	55.67%
1973-2002	278,562	186,166	92,396	33.17%
1974-2003	322,901	181,956	140,945	43.65%

The data points out that for the return on an all-equity portfolio to be equal to the return on an all-debt portfolio there must be a significant decrease in the equity market. The closest spread between the equity and debt portfolios was for the 30 year period ending 2002. The difference between the equity and debt portfolio values was \$92,396. For the portfolios to be equal, the decline in the equity portfolio would have to have been an additional 33.17% in the last year (2002). To put into context, this decline of an additional 33.17% is after the stock market had a 9.11% decline in 2000, an 11.88% decline in 2001 and a 22.10% decline in 2002.

## **Conclusions**

Results displayed in Tables 1 and 2 support the premise that long-term investors in the stock market will experience greater overall returns than similar long-term investors in the bond market. The study evaluated 35 different 30-year periods and found equity returns to be superior in all 35 periods.

Results displayed in Table 3 and 4 support the premise that fears of a large stock market downward correction that will leave equity investors worse off than had they invested in a bond portfolio are unfounded when the investor is a long-term investor.

## **APPENDIX A**

Year	Large Company Stocks: Total Returns in Percent	Long-Term Corporate Bonds: Total Returns in Percent
1940	-0.10	3.39
1941	-0.12	2.73
1942	0.20	2.60
1943	0.26	2.83
1944	0.20	4.73
1945	0.36	4.08
1946	-0.08	1.72
1947	0.06	-2.34
1948	0.06	4.14
1949	0.19	3.31
1950	0.32	2.12
1951	0.24	-2.69
1952	0.18	3.52
1953	-0.01	3.41
1954	0.53	5.39
1955	0.32	0.48
1956	0.07	-6.81
1957	-0.11	8.71
1958	0.43	-2.22
1959	0.12	-0.97
1960	0.01	9.07
1961	0.27	4.82
1962	-0.19	7.95
1963	0.23	2.19
1964	0.17	4.77
1965	0.13	-0.46
1966	-0.10	0.20
1967	0.24	-4.95
1968	0.11	2.57
1969	-0.09	-8.09
1970	0.04	18.37
1971	0.14	11.01
1972	0.19	7.26
1973	-0.15	1.14
1974	-0.27	-3.06
1975	0.37	14.64
1976	0.24	18.65
1977	-0.07	1.71
1978	0.07	-0.07
1979	0.18	-4.18
1980	0.32	-2.76
1981	-0.05	-1.24
1982	0.21	42.56
1983	0.23	6.26
1984	0.06	16.86
1985	0.32	30.09
1986	0.19	19.85
1987	0.05	-0.27
1988	0.17	10.70
1989	0.32	16.23
1990	-0.03	6.78
1991	0.31	19.89
1992	0.08	9.39
1993	0.10	13.19
1994	0.01	-5.76
1995	0.37	27.20
1996	0.23	1.40
1997	0.33	12.95
1998	0.29	10.76
1999	0.21	-7.45
2000	-0.09	12.87
2001	-0.12	10.65
2002	-0.22	16.33
2003	0.29	5.27



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