Financial Independence: Attainable, Maintainable

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This paper describes how to achieve financial independence both during one's career and during the retirement years by using the DRIP (Dividend Reinvestment Plan) to purchase stocks of quality companies that pay increasing dividends. The formula derived in this paper uses historical data over the 10 year period from 1998 – 2007 to compute returns.

INTRODUCTION

The purpose of this paper is to demonstrate how one can become financially independent, which we define as the ability to do anything you want to do, when you want to do it. In today's workplace, many people hate where they work, what they do, and who they work with. They count the number of hours they have left until retirement. Even worse, the dream of working a lifetime for the same organization and then sailing into the sunset of a funded retirement is now a thing of the past. Companies frequently downsize, eliminating jobs and forcing early retirement upon vested employees. How then does an employee provide for his/her family and successfully fund retirement dreams? The answer is through his/her investment portfolio. It is the one thing that cannot be taken away and that can guarantee financial independence. This paper illustrates how dividend growth generated from common stocks over a long period of time can provide an increasing supplement to salaried income and even replace it if needed due to economic and/or personal requirements.

According to Standard & Poor's (S&P) "The Outlook" (November 11, 2009), dividends from high-quality common stocks will become the primary financial instruments, rather than bonds, from which retirees will receive their income during the next decade. Furthermore, S&P reports that since bonds currently generate relatively low income and will continue to do so in the future, high-quality common stocks are the only choice for baby boomers' current and future investment income.

The Wall Street Journal (WSJ) reiterates the preceding line of thought in its "Personal Finance Section" (November 21, 2009), noting that dividend paying stocks historically have done better than non-dividend paying stocks. This has been the case during the bear markets of 1981-82, 1990, 2000-02, 2008, and the first quarter of 2009.

This paper will utilize a sample of stocks from the *S&P 500 Dividend Aristocrats Index* for 2009. The sample will be further limited to those stocks that (1) have a "strong buy" or "buy" recommendation from the S&P equity analysts and (2) have a record of consistently increasing dividends for at least the last 25 years.

Now let's assume that a person had invested in each of these selected stocks from 1998 through 2007 with an initial one-time only investment of $5000 and then simply reinvested the dividends for the next 10 years. By how much would the stock value have grown, and by how much would the dividend income have grown? *(The time period 1998 – 2007 was selected because it contains almost equally good years and bad years in the stock market. The bursting of the Tech bubble at the end of 2000 as well as the stock market highs in 2007 are both represented.)*

We begin this paper by deriving a formula referred to as the Q-DRIP (Quarterly Dividend Reinvestment Plan) formula which is used to determine the returns for the various stocks purchased over this 10 year period. Once the formula is established, we will use it to compare the accumulation of stock value during the 10th year with that of the initial investment of $5000 made during the first year. We also will use the formula to compute and then compare the dividend return of the stock from the first year and the 10th year. Output from these computations can be found in Tables 2 and 3.

Q-DRIP FORMULA

To derive the Q-DRIP (Quarterly Dividend Reinvestment Plan) formula, the formula used to compute accumulations in stock value, consider an arbitrary stock and let:

$P(n)$ = the price per share of stock during the nth year ($P(n)$ is computed by finding the average of the high and low price per share during the nth year),

$D(n)$ = the declared dividend per share of the nth year,

S = the number of shares initially purchased,

S_B = the number of shares owned at the beginning of the ith quarter,

S_E = the number of shares owned at the end of the ith quarter, and

S_P = the number of shares purchased during the ith quarter.

Two assumptions are made in the derivation of the formula. First of all, since $P(n)$ is the average price per share of stock during the entire n^{th} year, it will remain constant and not fluctuate throughout the year. Secondly, since the dividend is normally declared annually and distributed quarterly, it too will remain constant throughout the year and not change until the first quarter of the following year. Under these two assumptions then, the amount of dividend ($DIV(i)$) generated by one share of stock and used by the investor to purchase additional shares of stock during the ith quarter is:

$$DIV(i) = .25D\left(\left[\frac{i-1}{4}\right]+1\right),$$

where [ ] denotes the greatest integer function. Also, the price ($PRICE(i)$) per share of stock over this same time period is:

$$PRICE(i) = P\left(\left[\frac{i-1}{4}\right]+1\right).$$

Thus the quotient,

$$\frac{DIV(i)}{PRICE(i)} = \frac{.25D\left(\left[\frac{i-1}{4}\right]+1\right)}{P\left(\left[\frac{i-1}{4}\right]+1\right)},$$

represents the number of shares of stock purchased by the investor from the dividends of a single share of stock during the ith quarter. This continuing process is illustrated in Table 1.

TABLE 1
SHARES PURCHASED FROM THE DIVIDENDS OF ONE SHARE OF STOCK

Year	Quarters			
	1	2	3	4
1	$\dfrac{.25D\left(\left\lceil\frac{1-1}{4}\right\rceil+1\right)}{P\left(\left\lceil\frac{1-1}{4}\right\rceil+1\right)}$	$\dfrac{.25D\left(\left\lceil\frac{2-1}{4}\right\rceil+1\right)}{P\left(\left\lceil\frac{2-1}{4}\right\rceil+1\right)}$	$\dfrac{.25D\left(\left\lceil\frac{3-1}{4}\right\rceil+1\right)}{P\left(\left\lceil\frac{3-1}{4}\right\rceil+1\right)}$	$\dfrac{.25D\left(\left\lceil\frac{4-1}{4}\right\rceil+1\right)}{P\left(\left\lceil\frac{4-1}{4}\right\rceil+1\right)}$
2	$\dfrac{.25D\left(\left\lceil\frac{5-1}{4}\right\rceil+1\right)}{P\left(\left\lceil\frac{5-1}{4}\right\rceil+1\right)}$	$\dfrac{.25D\left(\left\lceil\frac{6-1}{4}\right\rceil+1\right)}{P\left(\left\lceil\frac{6-1}{4}\right\rceil+1\right)}$	$\dfrac{.25D\left(\left\lceil\frac{7-1}{4}\right\rceil+1\right)}{P\left(\left\lceil\frac{7-1}{4}\right\rceil+1\right)}$	$\dfrac{.25D\left(\left\lceil\frac{8-1}{4}\right\rceil+1\right)}{P\left(\left\lceil\frac{8-1}{4}\right\rceil+1\right)}$
3	$\dfrac{.25D\left(\left\lceil\frac{9-1}{4}\right\rceil+1\right)}{P\left(\left\lceil\frac{9-1}{4}\right\rceil+1\right)}$	$\dfrac{.25D\left(\left\lceil\frac{10-1}{4}\right\rceil+1\right)}{P\left(\left\lceil\frac{10-1}{4}\right\rceil+1\right)}$	$\dfrac{.25D\left(\left\lceil\frac{11-1}{4}\right\rceil+1\right)}{P\left(\left\lceil\frac{11-1}{4}\right\rceil+1\right)}$	$\dfrac{.25D\left(\left\lceil\frac{12-1}{4}\right\rceil+1\right)}{P\left(\left\lceil\frac{12-1}{4}\right\rceil+1\right)}$
4	$\dfrac{.25D\left(\left\lceil\frac{13-1}{4}\right\rceil+1\right)}{P\left(\left\lceil\frac{13-1}{4}\right\rceil+1\right)}$	$\dfrac{.25D\left(\left\lceil\frac{14-1}{4}\right\rceil+1\right)}{P\left(\left\lceil\frac{14-1}{4}\right\rceil+1\right)}$	$\dfrac{.25D\left(\left\lceil\frac{15-1}{4}\right\rceil+1\right)}{P\left(\left\lceil\frac{15-1}{4}\right\rceil+1\right)}$	$\dfrac{.25D\left(\left\lceil\frac{16-1}{4}\right\rceil+1\right)}{P\left(\left\lceil\frac{16-1}{4}\right\rceil+1\right)}$

Also note that:

$$S_E = S_B + S_P$$

$$= S_B + S_B \bullet \frac{DIV(i)}{PRICE(i)}$$

$$= S_B + S_B \bullet \frac{.25D\left(\left\lceil\frac{i-1}{4}\right\rceil+1\right)}{P\left(\left\lceil\frac{i-1}{4}\right\rceil+1\right)}$$

$$= S_B\left[1 + \frac{.25D\left(\left\lceil\frac{i-1}{4}\right\rceil+1\right)}{P\left(\left\lceil\frac{i-1}{4}\right\rceil+1\right)}\right].$$

Because $\left[1 + \dfrac{.25D\left(\left\lceil\frac{i-1}{4}\right\rceil+1\right)}{P\left(\left\lceil\frac{i-1}{4}\right\rceil+1\right)}\right]$ occurs as a factor in the above expression for each value of *i*,

then

by induction, at the end of *m* quarters,

$$S_E = S\left[\prod_{i=1}^{m}\left[1 + \frac{.25D\left(\left\lceil\frac{i-1}{4}\right\rceil+1\right)}{P\left(\left\lceil\frac{i-1}{4}\right\rceil+1\right)}\right]\right].$$

Therefore, at the end of *n* years (or *4n* quarters), the investor will have accumulated a value in stock of A dollars where

A = (Price per share during the nth year) • S$_E$

$$= P(n) \bullet S\left[\prod_{i=1}^{4n}\left[1 + \frac{.25D\left(\left[\frac{i\text{-}1}{4}\right]+1\right)}{P\left(\left[\frac{i\text{-}1}{4}\right]+1\right)}\right]\right]. \quad \text{(Q-DRIP formula)}$$

APPLICATIONS OF Q-DRIP FORMULA

Referencing Table 2, if one had invested $5000 in each of the 17 stocks and reinvested the dividends quarterly, then, at the end of 10 years, that portfolio would have grown in value from $85,000 to $199,396, resulting in a very nice 134.58% increase (annual rate of 8.9%).

TABLE 2
STOCK VALUE GROWTH WITH DRIP PLAN
1998-2007

Stocks Name	IIV	ICS	INS	FCS	FNS	FIV	% GAIN	ARR
Abbot Labs	5000	41.30	121.07	54.15	149.28	8083.37	61.67	4.92
Aflac Inc.	5000	17.00	294.12	54.55	322.11	17571.00	251.42	13.39
Archer Daniels	5000	16.10	310.56	38.75	357.29	13845.10	176.902	10.72
Bard (C.R.), Inc.	5000	19.70	253.81	85.95	288.42	24789.20	395.79	17.36
Becton, D'son	5000	37.00	135.14	77.60	151.72	11773.10	135.46	8.94
CenturyTel Inc.	5000	33.40	149.70	44.90	159.34	7154.27	43.09	3.65
Chubb Corp.	5000	36.05	138.70	50.85	170.93	8691.57	73.83	5.68
Coca-Cola	5000	71.25	70.18	54.95	84.14	4623.56	-7.53	-0.78
Exxon Mobil	5000	33.50	149.25	82.15	185.99	15278.90	205.58	11.82
Family Dollar	5000	16.95	294.99	26.70	330.70	8829.63	76.59	5.85
Johnson & Johnson	5000	38.3	130.55	64.25	155.07	9963.18	99.26	7.14
Lowe's Cos.	5000	9.20	543.48	28.35	564.63	16007.30	220.15	12.34
McDonald's Corp.	5000	31.05	161.03	53.00	187.06	9914.16	98.28	7.08
PepsiCo, Inc.	5000	36.20	138.12	70.45	161.85	11402.10	128.04	8.59
Proctor & Gamble	5000	40.00	125.00	67.80	148.16	10045.30	100.91	7.23
3M Company	5000	40.85	122.40	84.95	152.93	12991.60	159.83	10.02
Wal-Mart Stores	5000	30.10	166.11	46.75	180.38	8432.93	68.66	5.37
TOTAL	85,000					199,396.27	134.58	8.9

IIV = Initial investment value
ICS = Initial year's average cost per share ((high price – low price)/2)
INS = Initial number of shares purchased
FCS = Final year's average cost per share ((high price – low price)/2)
FNS = Final number of shares
FIV = Final investment value
% GAIN = Percentage total return
ARR = Annual rate of return in accumulations of stock value

Notably, some of the stocks did significantly better than average. Bard had over a 395% gain in stock value at an annual rate of return of 17.36%. Even during the collapse of the stock market in 2008 and into the first quarter of 2009, Bard held up well, recouping most of its losses by the end of the fourth quarter of 2009.

Aflac had over a 251% gain in stock value at an annual rate of return of 13.39%. Because its investment portfolio contained a significant amount of mortgage related loans and the fact that it is an insurance company, Aflac's stock had a substantial decrease in 2008 and into the first quarter of 2009. But by the end of the fourth quarter of 2009, Aflac had returned to its growth pattern.

Referencing Table 3, two stocks standout for their ability to grow dividends: Lowe's Cos. and McDonald's Corp. Lowe's had over 896% dividend gain at an annual rate of return in dividend income growth of 25.85%. McDonald's had over 849% dividend gain at an annual rate of return in dividend income growth of 25.23%. This is an income growth rate that few, if any, professions could match.

TABLE 3
DIVIDEND GROWTH WITH DRIP PLAN
1998-2007

Stocks Name	INS	IDS	IDI	FNS	FDS	FDI	% GAIN	ARI
Abbot Labs	121.07	0.60	73.04	149.28	1.30	191.18	161.77	10.10
Aflac Inc.	294.12	0.13	38.35	322.11	0.80	255.34	565.90	20.87
Archer Daniels	310.56	0.17	53.00	357.29	0.43	152.58	187.86	11.15
Bard (C.R.), Inc.	253.81	0.37	94.57	288.42	0.58	166.58	76.14	5.82
Becton, D'son	135.14	0.29	39.30	151.72	0.98	147.52	275.31	14.41
CenturyTel Inc.	149.71	0.17	25.50	159.34	0.26	41.28	61.89	4.93
Chubb Corp.	138.70	0.62	86.55	170.93	1.16	195.48	125.86	8.49
Coca-Cola	70.18	0.60	42.24	84.14	1.36	112.68	166.78	10.31
Exxon Mobil	149.25	0.82	123.52	185.99	1.37	252.17	104.16	7.40
Family Dollar	294.99	0.18	53.31	330.70	0.45	147.26	176.24	10.69
Johnson & Johnson	130.55	0.49	64.28	155.07	1.62	247.30	284.75	14.42
Lowe's Cos.	543.48	0.03	16.32	564.63	0.29	162.70	896.68	25.85
McDonald's Corp.	161.03	0.18	29.05	187.06	1.50	275.70	849.09	25.23
PepsiCo, Inc.	138.12	0.52	72.21	161.85	1.43	228.53	216.48	12.21
Proctor & Gamble	125.00	0.51	64.06	148.16	1.28	187.43	192.61	11.33
3M Company	122.40	1.10	136.01	152.93	1.92	289.53	112.88	7.85
Wal-Mart Stores	166.11	0.16	26.63	180.38	0.83	148.07	456.01	18.71
TOTAL			1037.94			3201.33	208.43	13.34

INS = Initial number of shares purchased
IDS = Initial declared dividend per share
IDI = Initial dividend income (first year)
FNS = Final number of shares
FDS = Final declared dividend per share
FDI = Final dividend income (last year)
% GAIN = Percentage return in dividend income growth
ARI = Annual rate of return in dividend income growth

As discussed previously in referencing Table 2, Aflac had a sharp drop in stock value in 2008 and in the first quarter of 2009. But the dividend did not suffer; it increased by almost 17% in 2008. If the world came to an end in 2008, Aflac did not know it. The table further documents that Aflac's percentage return in dividend income growth over the 1998 – 2007 time period was almost 566%. This is an annual rate of approximately 21%! Whose salaried income increases at 21% annually?

It is important to note that both Bard and McDonald's are ranked 1 (highest) for relative safety and A++ (highest) for company's financial strength by "Value Line Investment Survey" (November 22, 2009). Thus, these two stocks are virtually United States Treasury substitutes for safety with a much higher capital and dividend growth rate.

Even though Aflac lost its United States Treasury substitute ranking for safety because of mortgage loan investment related losses, these shares have above-average capital gain appreciation potential and

annual dividend growth rate ("Value Line Investment Survey," October 16, 2009). Aflac should hold to its tradition for capital appreciation and dividend growth as the economy slowly improves.

By reinvesting the dividends (DRIP plans) as illustrated by Tables 2 and 3, Dollar-Cost Averaging, the most basic of investment strategies, is implemented. As Standard & Poor's "The Outlook" (September 3, 2008) discusses, Dollar-Cost Averaging is an investment strategy that literally guarantees purchasing the most shares of stock when their prices are low and the least shares of stock when their prices are high. It is a mathematical truth that, by following such an investment strategy, the average cost per share will be substantially below the highs in the market. The dividends reinvested purchase whole shares and fractions of shares which in turn generate their own dividends, allowing the compounding effect and geometric rise in stock value and dividend growth.

The DRIP plans eliminate the emotions that influence investment decisions. In 2008 and into the first quarter of 2009, when the stock market was reaching generational lows and the volatility was overwhelming, the investor who maintained loyalty to the DRIP plans was forced to buy shares as prices declined. As the market posted a more than 60% gain in the last three quarters of 2009, the investor was limited in the number of shares that could be purchased at the higher prices.

Notice that had an investor pocketed the dividends instead of reinvesting them, the portfolio would have been worth only $173,403 ($26,000 less than with the DRIP plans) for a percentage gain of 104% (annual rate of 7.39%). The annual rate of return in dividend income growth would have been 11.64%, which is 1.7% less than when the dividends are being reinvested (See Tables 4 and 5).

TABLE 4
STOCK VALUE GROWTH WITHOUT DRIP PLAN
1998-2007

Stocks Name	IIV	ICS	INS	FCS	FNS	FIV	% GAIN	ARR
Abbot Labs	5000	41.30	121.07	54.15	121.07	6,555.94	31.12	2.75
Aflac Inc.	5000	17.00	294.12	54.55	294.12	16,044.25	220.89	12.37
Archer Daniels	5000	16.10	310.56	38.75	310.56	12,034.20	140.68	9.18
Bard (C.R.), Inc.	5000	19.70	253.81	85.95	253.81	21,814.97	336.30	15.87
Becton, D'son	5000	37.00	135.14	77.60	135.14	10,486.86	109.74	7.69
CenturyTel Inc.	5000	33.40	149.70	44.90	149.70	6,721.53	34.43	3.00
Chubb Corp.	5000	36.05	138.70	50.85	138.70	7,052.90	41.06	3.50
Coca-Cola	5000	71.25	70.18	54.95	70.18	3,856.39	-22.87	-2.56
Exxon Mobil	5000	33.50	149.25	82.15	149.25	12,260.89	145.22	9.38
Family Dollar	5000	16.95	294.99	26.70	294.99	7,876.23	57.52	4.65
Johnson & Johnson	5000	38.3	130.55	64.25	130.55	8,387.84	67.76	5.31
Lowe's Cos.	5000	9.20	543.48	28.35	543.48	15,407.66	208.15	11.91
McDonald's Corp.	5000	31.05	161.03	53.00	161.03	8,534.59	70.69	5.49
PepsiCo, Inc.	5000	36.20	138.12	70.45	138.12	9,730.55	94.61	6.88
Proctor & Gamble	5000	40.00	125.00	67.80	125.00	8,475.00	69.50	5.42
3M Company	5000	40.85	122.40	84.95	122.40	10,397.88	107.96	7.60
Wal-Mart Stores	5000	30.10	166.11	46.75	166.11	7,765.64	55.31	4.50
TOTAL	85,000					173,403.32	104.00	7.39

IIV = Initial investment value

ICS = Initial year's average cost per share ((high price – low price)/2)

INS = Initial number of shares purchased

FCS = Final year's average cost per share ((high price – low price)/2)

FNS = Final number of shares

FIV = Final investment value

% GAIN = Percentage total return

ARR = Annual rate of return in accumulations of stock value

TABLE 5
DIVIDEND GROWTH WITHOUT DRIP PLAN
1998-2007

Stocks Name	INS	IDS	IDI	FNS	FDS	FDI	% GAIN	ARI
Abbot Labs	121.07	0.60	72.64	121.07	1.30	157.39	116.67	8.97
Aflac Inc.	294.12	0.13	38.24	294.12	0.80	235.30	515.32	22.37
Archer Daniels	310.56	0.17	52.80	310.56	0.43	133.54	152.92	10.86
Bard (C.R.), Inc.	253.81	0.37	93.91	253.81	0.58	147.21	56.76	5.12
Becton, D'son	135.14	0.29	39.19	135.14	0.98	132.44	237.94	14.49
CenturyTel Inc.	149.71	0.17	25.45	149.71	0.26	38.92	52.93	4.83
Chubb Corp.	138.70	0.62	85.99	138.70	1.16	160.89	87.10	7.21
Coca-Cola	70.18	0.60	42.11	70.18	1.36	95.44	126.64	9.52
Exxon Mobil	149.25	0.82	122.39	149.25	1.37	204.47	67.06	5.87
Family Dollar	294.99	0.18	53.10	294.99	0.45	132.75	150.00	10.72
Johnson & Johnson	130.55	0.49	63.97	130.55	1.62	211.49	230.61	14.21
Lowe's Cos.	543.48	0.03	16.30	543.48	0.29	157.61	866.93	28.67
McDonald's Corp.	161.03	0.18	28.99	161.03	1.50	241.55	733.22	26.56
PepsiCo, Inc.	138.12	0.52	71.82	138.12	1.43	197.51	175.01	11.90
Proctor & Gamble	125.00	0.51	63.75	125.00	1.28	160.00	150.98	10.77
3M Company	122.40	1.10	134.64	122.40	1.92	235.01	75.55	6.38
Wal-Mart Stores	166.11	0.16	26.58	166.11	0.83	137.87	418.70	20.07
TOTAL			1031.87			2779.39	169.35	11.64
INS = Initial number of shares purchased								
IDS = Initial declared dividend per share								
IDI = Initial dividend income (first year)								
FNS = Final number of shares								
FDS = Final declared dividend per share								
FDI = Final dividend income (last year)								
% GAIN = Percentage return in dividend income								
ARI = Annual rate of return in dividend income								

Not reinvesting the dividends also has a significant impact on individual stock value growth and dividend growth rates. For example, McDonald's had a 70.69% gain in stock value and a 733.22% gain in dividend growth without the DRIP plan. This is 27.59% less gain in stock value and 115.87% less gain in dividend growth than would have occurred had the dividends been reinvested. It pays to reinvest the dividends.

CONCLUSION

Results from the Quarterly Dividend Reinvestment Plan (Q-DRIP) formula derived in this paper prove the efficacy of long-term investment in quality stocks that have a record of consistency in dividend increases. Thus, investments in high-quality dividend paying stocks can provide a safe and long-term plan for financial independence for those who have retired or will soon retire, thereby negating the longevity risk of outliving one's income.

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