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Valuation, Dividend Yield, and the Expenditure Savings Multiple

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Abstract

In this paper we examine the relationship between valuation, dividend yield, and the ability to sustain a retirement spending goal through dividends. We call our measure the expenditure savings multiple. Our measure helps frame the question as to whether a retirement spending goal can be satisfied through dividends alone.

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1 Introduction

Traditional investors save for retirement by putting aside capital for later use. A key concern in retirement becomes sustaining withdrawals without depleting the portfolio. Dividends from the invested capital provide passive income and are often considered an integral part of retirement expenditures. Reliance on dividend income alone allows an investor to preserve all principal. In this paper, we identify the amount of capital an investor would have needed historically to reach a future expenditure goal without withdrawing from savings principal. We further discuss the forward-looking prospects of success with such a strategy given changing market conditions and dividend payouts.

2 Lit. Review

In 1976, Fisher Black published "The Dividend Puzzle", arguing that there was no convincing explanation for a company to pay cash dividends to their shareholders. Fisher claimed that in a world without market imperfections the value of a company will be determined by its ability to generate earnings; a dollar paid out in dividends should be viewed as one less dollar in capital gains (Julio, 2014). Michael Jensen (1986) argues that dividend payouts increase the value of mature, cash-generating companies. Jensen (1986) suggests that to maximize value, mature companies with limited growth opportunities should pay out all "free cash flow" that cannot be profitably reinvested. However, firms have been shown to pursue low-yielding short-term profit over long term investment and growth (Julio, 2004)

Golez has shown that there is a growing disconnect between earnings and dividends which is continuously reducing the ability to predict dividend growth rates. This could be problematic for future investors who desire to avoid spending capital during retirement. In 1945, firms paid out close to 80% of their earnings, however, by the year 1982, the dividend to earnings ratio had drastically fallen and firms only paid out approximately 45% of their earnings. A lower dividend-to-earnings ratio implies that firms are delaying payment of dividends and favoring retained earnings; expected returns are more consistent (Golez, 2018).

Growth stocks are often associated with a high price to earnings ratio and a high market price to book value ratio. Value stocks tend to be associated with a low price to earnings, low price to book, or low price to cash flow ratio (Ibbotson, 1997). Above average dividend yields can be a potential indicator that an investor will be undertaking a higher level of risk (Ibbotson, 1997). Golez (2018) demonstrates that dividend yields predict returns and, therefore, that discount rates vary over time. But what drives these fluctuations in expected returns? One explanation is that the market has less risk-bearing capacity in downturns, giving rise to countercyclical discount rates (Golez, 2018).

Arnott (2003) explains that if payout ratios are low, it can be a challenge to sustainably live off dividends. A meta-analysis of the literature shows a trend in declining dividend-to-earnings, (Golez, Arnott) but the research has not yet addressed the sustainability of living from dividend income across several asset class allocations over time.

3 Problem Statement

What is the minimum amount of savings a retiree could have and sustain a retirement expenditure goal with only dividends? In this paper, we seek to show the historical context for determining a savings level to support an expenditure goal with dividends and provide insight into applicability of the findings in future periods.

4 Methodology

To determine whether an individual could sustain a retirement spending goal with only dividends, we consider the historical savings level on which a retiree could have relied. This analysis follows a close parallel to the method employed by Bengen (1994) in constructing a safe maximum withdrawal rate. Bengen used historical data to create a framework which identified safe withdrawal rates over time by analyzing withdrawal rates, with consideration for inflation, on varying asset allocations with. Bengen discovered that a withdrawal rate of 4% in conjunction with a portfolio that consists of 50 to 75% stock is optimal for mitigating risk. He found this to be the highest withdrawal rate that would have never depleted the retiree's savings.

The key difference here is that the withdrawal rate is "known" in that it is the dividend yield for the year. Instead, we seek to discover the minimum level of savings that would support a retirement expenditure goal from only the dividend component, without the need to spend capital. For the purposes of the research, this withdrawal rate framework will be repurposed to apply to the total dividend yield, rather than total portfolio value.

We assume an investor has 100% of their savings invested in large-cap U.S. stocks. The all-equity portfolio is appropriate considering the research question. This aids in determining the sustainability of an all-dividend expenditure goal. Solving for the safe minimum savings on this portfolio will provide a starting point from which practical adjustments can be made, such as an allocation to bonds to provide stability. The data is from the Ibbotson Stocks, Bonds, Bills, and Inflation 2016 Yearbook. The total return as well as income return for large-cap stocks from 1926-2015 are considered.

We consider a retiree in each year, starting in 1926, and ask "What is the minimum amount of savings a retiree could have and sustain a retirement expenditure goal with only dividends?" Because each retiree will have a different nominal spending goal based on their lifestyle needs, the minimum savings needed is measured as a multiple of the expenditure goal. We call this the Expenditure Savings Multiple. For example, if a retiree needs $50,000 in the first year of retirement and has $1,000,000 saved, the retiree has an Expenditure Savings Multiple of 20. By measuring the minimum savings as a multiple, the conclusion can be applied to any amount of nominal spending.

A retirement period of 30 years is used as both a practical and common retirement period (World Bank, 2017). The first year's expenditure goal is adjusted for inflation in each subsequent year to account for real purchasing power. Because the retiree seeks to accomplish an expenditure goal, but cannot control dividend yield, it is important to address instances where the expenditure goal for the year and the dividend yield on the savings differ. The criteria for a successful 30-year sustained retirement includes dividends that adequately cover the expenditure need each year. Therefore, a constraint of the test is that the dividends must equal or exceed the expenditure goal for each year. If during the test of a given 30-year period, it is found that the expenditure goal exceeds dividends, then the test fails, and the savings multiple must be

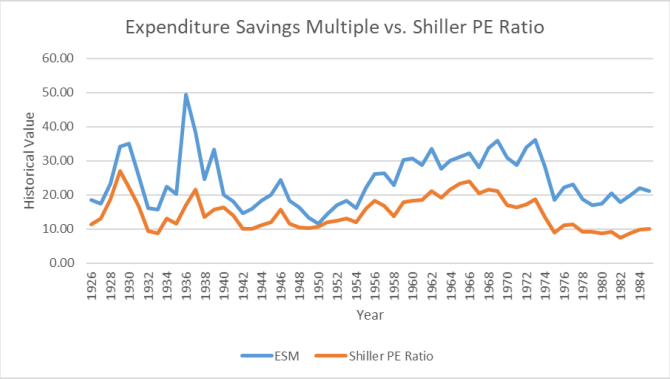
increased. However, the retiree may not need to spend all the dividends each year to meet the expenditure goal. In those instances, the dividends are reinvested.

5 Test Results

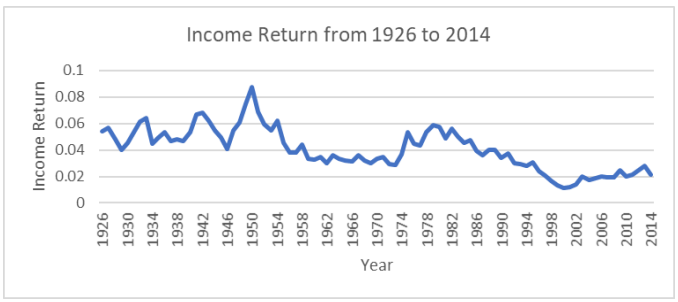
Using the in-sample period from 1926 to 1985, the last date in the data set from which an ESM can be calculated to support a 30-year retirement, we regress the PE10, Income Return, and ESM to find equation 1 as follows:

$$ESM = 23.04 + .84(PE10) - 234.78(Income\ Return) \quad \textbf{(1)}$$

The equation is significant at the 95% confidence level with a coefficient of determination .71. The Expenditure Savings Multiple has a strong positive correlation with the Shiller PE Ratio. As the Shiller PE ratio increases throughout time, ESM the also increases. In 1926, the average Shiller PE ratio across 30 years from date was 13.91. The average PE ratio across 30 years reached a peak of 23.30 from date in 1985; the ESM closely follows this trend.



The data presents a strong negative relationship between the ESM and Income Return. The average Income Return across 30 years from date has nearly halved from 5.6% in 1926 to the historical minimum return of 2.54% in 1985. This is reflected in the ESM values. Lower dividend yields translate into higher ESM values. When dividend yields are higher, a smaller initial investment is required to sustain a dividend expenditure goal and the ESM drops. As seen by the graph of the ESM vs. the Shiller PE ratio, there is a substantial increase in both historical values from 1926 to 1929, the roaring twenties. It is followed by a sharp decline during The Great Depression from 1930 to 1933. The most volatile increase in the ESM occurred between 1933 and 1936, this may be contributed to The New Deal under the presidency of Franklin D. Roosevelt.



These relationships are not a surprise. It is widely established that the cyclically adjusted price to earnings ratio of Shiller provides a strong indication of market returns over the next decade (Campbell & Shiller 1988, Fink & Fink 2016). This is not simply an empirical artifact as there is strong theoretical support for this relationship. When prices are high relative to earnings, the market is said to be overvalued. It is reasonable to expect an overvalued market to provide lower returns in the future as valuations normalize. Lower future returns translate into lower portfolio values on which the dividends are earned.

The income return of the Ibbotson series form which the data was taken represents the dividend yield. Once again, the negative correlation between this factor and the ESM is logical and is the central element of this paper. When dividend yields are lower, retirees will need a larger portfolio to cover an expenditure goal.

6 Conclusion

Using the regression equation for the in-sample data, we estimate forward ESM values for the out of sample period 1986 to 2014. The average predicted ESM value for this period is 37.26. That contrasts significantly with an average ESM of 24.11 with the in-sample period. For the final year of the data set, 2014, the forward ESM is estimated to be 38.9.

The minimum expenditure savings multiple identified was 11.6, with an average ESM of 24.11. However, that was found during a period with 8.77% average dividend yield. Going forward, we expect lower dividend yield which will increase the savings needed. The forward-looking savings multiple could be as high as 38.9. This presents a significant challenge for retirees who intend to employ an all-dividend approach to retirement. The ESM continues to increase over time, suggesting that a higher level of savings is needed to support future expenses in the face of declining income return. This trend is expected to continue. Firms over the 1954-2017 period have drastically reduced the frequency of stock dividends until they essentially vanished. The probability that a firm pays stock dividends decreases by a factor of 75 from about 15% in the 1950s to less than 0.2% in the 2010s (Kalay, 2019). Additionally, Kalay (2019) notes that as investors at large become more sophisticated, the frequency of stock dividends drop. It is fair to acknowledge that there are additional factors which have an impact on dividend earnings, such as dividend smoothing. However, this is beyond the scope of this paper and has not been included in the literature review.

In future studies, we will address this concern by considering other allocations that may provide higher dividend yields than a broad index of domestic large-cap stocks. These studies will need to address the inherent tradeoffs of such a strategy.

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