Much Ado About Dividends

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Abstract

Dividend paying stock are commonly employed to introduce an income component into equity portfolios, with the promise of achieving higher total returns while managing lower risk. This study examines globally traded dividend portfolios constructed using high yield or dividend growth signals. It is observed that the performance of dividend portfolios varies across geographies;however, high yield strategies consistently provide investors with the highest aggregate returns in advanced economies over time. When index returns are stratified, it becomes apparent that during periods of low volatility, high yield strategies outperform dividend growth strategies, and all portfolios yield higher returns during interest rate hiking cycles than during cutting cycles. The consistency of returns from these portfolios over time is found to be poor, with South African strategies showing the highest level of consistency over the past decade when assessed on a rolling basis. In evaluating portfolio risk by geography, we note that advanced markets have historically experienced fewer drawdowns, whilst emerging markets and South Africa have exhibited seemingly improving risk measures within the same period.

1. Problem Statement

As summarized by Vanguard (2017) succinctly, "the focus of high dividend-yielding equities is often their income potential, but higher yields do not necessarily translate into higher returns. This is because, for all companies, whether or not to pay a dividend is a capital budgeting decision. When a stock goes ex-dividend, its price falls by the same amount as the dividend payment. Therefore, no wealth is created through paying a dividend; rather, the payment reduces retained earnings. This means that share price should decrease accordingly thus share

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holders should be worse off. Thus, brings in the question of why dividend strategies provide for a return signalling cue. First, there should exists a rationale beyond dividend payment effect on share price, perhaps in line with theories regarding dividend relevance. Second, if the signals provide some type excess return beyond their market index, does it continuously provide the premium to be harvested by a systematic investment strategy.

2. Research Aim

The aim of this study is to test whether and why dividend payout strategies contain a profitable investment signal to potential investors. There exists various international studies testing this hypothesis across geographies, underscoring that dividend can be used as a profitable future return signal. Studies conducted for the South African market employ methodologies that do not inform readers on mechanisms behind why the dividend signal works or provide an indication of returns for a systematic dividend investment strategy. We aim to fill this gap by testing various portfolios constructed based on dividend information in South Africa.

3. Introduction

This paper seeks to investigate the return signalling cue of dividend paying stock. The value of dividends towards shareholders has long been debated with academics and practitioners providing evidence for their irrelevance and relevance. Miller & Modigliani (1961) proposed the dividend irrelevance theorem that essentially argues that dividend payments were irrelevant as this detracted from the shareholder value as wealth is affected by the income a firm generates, not the way the firm distributes that income. Against this, Gordon (1962) argued that certain cash flows should be preferred by investors as opposed to the riskier capital gains. Moreover, when we consider that the MM theory was developed under unrealistic conditions therefore real world constraints such as taxes and transactions cost that are major considerations when determining asset allocation can cause investors to prefer some exposure to dividend paying stock in their portfolio. Consequently theories such as information asymmetries, tax considerations, return signalling all give convincing arguments of dividend payment address some real world considerations. Overall, if we are assume that markets are efficient and the value of a stock is a function of its future dividends, then stock that do not pay dividends should have a value of zero unless there is some expectation of the future reciepts of investment is said stock (Campbell, 2017). This brings in the question, if there is new information that affects a companies future cash flows, what will happen to stock price? Event studies on dividend payments address this and often times it is noted that the payment of dividends leads to a decrease in prices thus stock valuation. Suwanna (2012) shows that dividend announcement decrease share prices to the value of the dividend. This could be that dividend are a capital

budgeting decision and their payment reduces retained earnings and consequently affects that the share price.

This study provides an extensive investigation into the return signaling of dividend portfolios. Firstly, we address the question, when do dividend signals work? To achieve this we first look at the cumulative excess returns offered by dividend indexes. Our analysis shows us that dividend portfolios, wheter high yield (HY) or dividend growth (DG) do not give an clear signal to return, with the exception of our proxy for United Kingdom (HY) index that showed great performance over our sample period[1].

Taking the analysis a step further we stratified our sample according to interest rate cycles (Hiking, Cutting and Neutral) and market regimes (High and Low Volatility), unique to geography and we start to find when dividend signals work. Within market regimes, we generally observe that dividend signals offer defensive characteristics, thus giving higher excess returns in periods of high market stress. This does not infer positive return for all indexes, our proxies for United States (US) HY , UK HY and World indexes returned negative over their respective periods. the study also evaluates the consistency of performance among dividend portfolios using a rolling information ratio. From this dynamic measure, we note the inherent lack of consistency in all dividend portfolios. However, coupled with drawdowns experienced in different jurisdictions, we acknowledge that advanced market dividend portfolios experience the least variation in drawdowns compared to emerging markets. The results indicate that both growth and high-yield dividend portfolios tend to under perform relative to their benchmarks,

[1]our metric of performance is the excess return, purely because it gives a clear picture of deviations in performance for index and benchmark

raising questions about their consistency in delivering positive returns. We then move on to how dividend portfolios work, with the goal of constructing a portfolio that can best harness the existing premium. We use share data from the Johannesburg Stock Exchange (JSE), with our benchmark being the JSE Top 40 index. We construct four portfolios varying in complexity, with the most advanced accounting for price momentum and dividend payout sustainability.

4. Literature Review

4.1. What are dividends

Dividends constitute a form of capital distribution by corporations towards shareholders. They exist in various forms, such as cash, stock, liquidating, scrip, or property dividends Baker & Powell (1999), of which cash dividends and share repurchases being the most commonly used in practice. Within cash dividends, regular dividends are widely used by corporations and payment frequency across jurisdictions. The decision to issue dividends is typically made by the board of directors, and approved by shareholders, however practiced more in Europe and less so in the United States. The payout policy policy of a corporation, which are guiding principles for management and board of directors towards capital distributions considers company investment and is closely watched by investors and analysts. As such, management strives to grow or maintain a certain level of dividend payouts as this signals firm growth and investors share of profitability in the company.

4.2. Theorectical Arguments on Dividend Payments

Given the apparent decrease in shareholder value, the logical question has encouraged a long running debate on dividend relevance and irrelevance. In 1961, Miller & Rock (1985) opined that dividends are irrelevant (MM theory), he argued that shareholders are indifferent to dividend payments, thus implying that there is no optimal dividend policy and that all dividend policies are equally good and payments of dividends could easily be reinvested in shares and make no difference to share holder wealth. However, the MM theorem fails to consider real-

world market imperfections that may give relevance to dividend payments. The bird in the arguments opposes the MM theory, suggesting that investor would prefer to receive less risky cash flow in the form of dividends instead of potential capital gains at some point in the future (Gordon, 1962). This permeates to the cost of equity, since dividends are less risky, companies that issue more dividends should have higher share prices. However, propoents of the MM theory contend this suggesting the risk of future cash flow is affected by the payment of dividend, leading to negative effects on share prices after the ex-dividend date. The dividend puzzle considers real world constraints and gives an interesting take on its relevance and irrelevance, by suggesting that dividends reduce equity value and make investors worse off; however, are a reward to investors who bear the risk associated with their investments as it provides an additional source of return on investment from a share Black (1996). Various literature has made convincing arguments for corporations to pay dividends which include tax considerations, dividend signalling and agency costs in issuing dividends .

Taxe considerations argue in favor for dividend relevance. Across jurisdiction dividends have different tax treatments to capital gains and often tax at a higher income tax rate, thus investors that have higher tax rates choose stocks with lower dividend payouts and transversly pushes up the stock price, this is called the clientele effect Baker & Powell (1999). However a major pushback emanates from proponents of the MM theory, that suggest the client effect causes major substitution effect, meaning that if companies change their dividend policy, investors with preferential tax treatment will simply allocate more capital to that stock and those out of favor will sell their shares. Given the large number of investors versus listed companies the process is instantaneously causing a net zero effect on prices(Baker & Powell, 1999). Second, flotation

costs refer to the opportunity costs incurred by a firm when paying dividends. Through distributing dividends, companies forego opportunities to expand their operations using retained earnings. In a world without flotation costs, as suggested by the MM theorem, management would be indifferent between issuing dividends and borrowing from the market thus have no effect on shares prices. However, in reality, external financing comes at a higher cost, leading to trade-offs in dividend policy decisions and ultimately share prices.

Information asymmetry between shareholders and managers is another factor that gives relevance to dividend payments. Managers of businesses have greater knowledge of operations thus value of a business at any given point more than shareholders. As such, investors rely on dividend announcements to assess a company's valuation. Dividend signaling conveys information about the company's quality Baker & Powell (1999). Investors compare dividend announcements to historical levels while considering company fundamentals. However, a major concern towards its ability to be "gamed' by management, making the dividend signal imperfect for determining share prices. Principal agency issues may give another reason for issuance of dividends. The free cash flow hypothesis suggests that dividend payments force management to raise capital from external sources, which increases borrowing costs and scrutiny from capital markets. This, in turn, reduces management's ability to make sub optimal investments and aligning management and shareholder objectives (**baker2009understanding?**). Supporters of this theory ascertain that dividends payments by the mechanism encourage good business practices.

4.3. Investment Strategies from Dividend signals

The amount of literature regarding dividend relevance leaves readers wiser. Thus, it can be reasonably concluded that the past performance of dividend-based portfolio strategies could be understood by using proxy arguments (as opposed to it being considered an attractive feature in itself). For example, high dividend-paying companies could proxy for the quality of management structures over time (through their ability to consistently afford dividend payments) or similarly point to prudent cash-flow management capabilities. Therefore, from the perspective of an investor, the dividend yield can be used as a signal in constructing an investment strategy. O'higgins & Downes (1991) proposed an investment strategy which used companies included in the Dow Jones Industrial Average (DJIA) called the "Dogs of the Dow" (DOD). By ranking 30 companies by dividend yield and including only the 10 highest-yielding shares in a portfolio, this achieved a return higher than the DJIA (16.6% per annum versus the DJIA's 10.4%). This had lower risk than the DJIA, thus achieving a higher Sharpe Ratio. Testing O'higgins & Downes (1991)'s strategy resulted in "Beat the Dow 5," which involved annually investing in only the five lowest-priced of the HY10 shares each year, in other words, high dividend yield. This strategy gave superior returns of 19.4% versus the DJIA. As opined by Gardner, Gardner & Maranjian (2002), this strategy leverages the fact that low-priced stocks experience the most volatility, by courting future volatility in the 10 stocks that have some potential upside, expecting their stock prices to rise in return.

Many more studies emerged examining the DOD strategy or similar high-yield dividend strategies, in different time periods and regions, consistently showing superior risk-adjusted returns

compared to the market index. Examples of such studies include Lemmon & Nguyen (2015) in Hong Kong, Brzeszczyński & Gajdka (2007) in Poland, Visscher & Filbeck (2003) in Canada, Filbeck & Visscher (1997) in Britain, and Wang, Larsen, Ainina, Akhbari & Gressis (2011) in China. More recently, Filbeck, Holzhauer & Zhao (2017) investigated the performance of DOD against a high-yield portfolio of Fortune Most Desired Companies (MAC) compared to the Dow Jones Industrial Average and the S&P 500. The study found significantly higher risk-adjusted returns for the DOD strategy. In South Africa, Fakir & others (2013) employs a parametric approach to investigate dividends as an investment strategy. However there are issues with such methodology.First, on the JSE the signal-to-noise ratio on regressed stock returns is low, implying that the modeler's ability to accurately attribute return differences to a variable of interest (e.g., DY) is severely undermined. This is often rectified by considering returns at a lower frequency (e.g., monthly or even annually) to partially control for noise. Also, studies using parametric techniques seek to infer statistical significance, often leaving the more applied reader with limited knowledge gained as to the actual profitability of considering said signal from a portfolio context. Secondly, returns tend to be non-normally distributed and have large outliers. The combination of these problems can easily lead to a small sample size, non-normally distributed, and noisy inference series (especially in a local application) with limited practical application. In practice, subset portfolios are used, which are compared in-sample performances. While not necessarily providing readers with a parametric significance test, portfolio risk and return measures based on systematically constructed portfolios serve to provide valuable insights. Various such applications exist in the literature. Damodaran (2004) constructs top decile portfolios based on trailing DY at the beginning of each year from

1952 to 2001. For the last sample period (1991 - 2001), it is found that the highest dividend-yielding portfolio outperformed the lowest by about 3%. Conover, Jensen & Simpson (2016) find that portfolios constructed from high-dividend payers return over 1.5% more per year than non-dividend payers, in addition to having lower risk.

Dividend signaling can be catergorized in two forms, namely high yield (HY) or dividend growth per share (DG). Whereas HY confirms is typically used as a value proxy, it's a poor proxy given its relation to price if we consider a constant payout ratio. For this reason, the use of DGPS provides attributes that aim to curtail negative aspects of HY. That is, DGPS for corporations, and unlike the dividend yield, it is not affected by price but maintains properties that allow for inference into management quality. As management is aware of the signaling effect of dividends, this may induce the value trap, forcing management to continually increase dividends to maintain a certain valuation. However, such companies are more vulnerable to facing financial distress.

5. Methodology

To evaluate the return predictive signal of dividends, we employ an applied approach that constitutes constructing subset portfolios and compare in sample performances. Our approach aims to give valuable insights based on risk and return for systematically constructed dividend portfolios.

5.1. Portfolio optimzation

The Modern Portfolio Theory defines risk of a portfolio of (n) assets as the variance (σ^2) of its returns (r_t). We add a refinement to this, and our definition returns is achieved by decomposing it into common factor (Xf) and specific return (u) as $(r = Xf + u)$. From these returns we create a factor covariance matrix, defined as $(XFX^T + D)$ in which we derive our multiple factor universe consists of (k) common factors.

X $= n \times k$ matrix of asset exposures to the factors,

F $= k \times k$ positive semi-definite factor covariance matrix, and

D $= n \times n$ positive semi-definite covariance matrix representing a forecast of asset specific risk.

We periodically calculate each asset exposure to the common factors calculated in the factor covariance matrix. This then assists us in computing forecasts of the level of each asset specific risk. The short term risk forecasts will then be used to gauge contribution of each asset to a portfolio over risk which contributes to the portfolio construction process. For our optimization, risk takes on two forms being total risk (only portfolio holdings are considered and benchmark

holdings are irrelevant for the optimization process) and active risk (difference between portfolio holdings and benchmark holdings are given consideration in the optimization problem).

Defined as; *Total Risk*: $h^T \left(\lambda_F X F X^T + \lambda_D D\right) h$

Active Risk: $(h - h_B)^T \left(\lambda_F X F X^T + \lambda_D D\right) (h - h_B)$

where,

$\lambda_F =$ common factor risk aversion parameter,

$\lambda_D =$ specific risk aversion parameter,

$h = n \times 1$ vector of managed portfolio's holdings, and

$h_B = n \times 1$ vector of normal (benchmark) portfolio's holdings

5.2. Constraints

Optimization involves using set of constraints that helps in attaining convergence, i.e giving a set of weights that determine our optimum portfolio. In practice, this is unique to portfolio managers given their risk objectives and goals[2]. We use:

- Common factor and specific risk aversion parameters of 0.0075 and 1, respectively.
- Our investment universe is the Top 50 stock listed on the JSE,therefore our selection criteria depends on market capitalization and liquidity. We use the Capped SWIX as the benchmark.

[2]see https://www.sciencedirect.com/science/article/pii/S1057521921002556 for a detailed explanation on advantages of using maximum utility operators to efficiently factor investor risk preferences

- Portfolios are re-balanced quarterly.
- Active risk constraints to parent benchmark 5%
- Our sector exposure has a +/-10% limit; holds no property stocks in the portfolio
- Individual stock have a 15% max exposure limit
- Quarterly turnover is limited to 10%.

5.2.1. Tax considerations

Portfolio theory was developed in a perfect world without friction. In practice, frictions need to be considered and in portfolio construction this often entails considering the effect of taxes on income and capital gains as they can erode returns and significantly alter risks and return characteristics of shares. The contribution of dividends and capital gains to total return can lead to varying tax inefficiencies for shares as most jurisdictions imposed higher taxes than on capital gains. Therefore shares with higher contribution of dividends will be less tax efficient than those with a higher capital gains component and with timing most jurisdictions tax dividends in the year that they are receive[3].

Jurisdictional laws can also affect the distribution of taxable returns amongst shares depending on their class namely ordinary shares or preferred shares. Preferred shares are viewed as a substitute for bonds and income from preferred shares are often given tax at a lower rate than those from dividends from ordinary shares.

We will not survey global tax regimes or incorporate all potential tax complexities into the portfolio construction but assume a high level commonalities exists amongst all jurisdictions this study uses. This is a reasonable assumption considering the summary of taxes on dividends and capital gains from major economies. For simplicity, we will assume a basic tax regime includes the key elements of investment-related taxes that are representative of what a typical taxable asset owner of a global portfolio will contend with. The proposed methodology to employ on the dividend portfolios use the following methodology.

[3]See Deloitte's tax guides and country highlights: https://dits.deloitte.com/#TaxGuides

$$r_{at} = p_d r_{pt} (1 - t_d) + p_a r_{pt} (1 - t_{cg})$$

where r_{at} the after tax return, p_d= the proportion of r_{pt} attributed to dividend income, p_a= the proportion of r_{pt} attributed to price appreciation, t_d= the dividend tax rate and t_{cg}= the capital gains tax rate

5.3. Dividend Signals

We will rank stock within our selected universe by dividend signals, specifically using a proxy for dividend yield (DY) and dividend growth per share (DG). The procedure and characteristics of each portfolio are given as;

5.3.1. DIVI1

Rank score (i.e. between 0 and 100) calculated using:

We use a combination of 2/3 DY (3m fwd) and 1/3 DY (9m fwd), Dividend Coverage Ratio and Price Momentum. The signal uses conditions: - if dvd_cover score is in bottom quintile, then add it at 15% (15% dvd cover, 66.667% * 0.85 DY3m, 33.333% * 0.85) if Price momentum score is in bottom quintile, then add it at 35% (35% PX momentum score = 66.667% * 0.65 DY3m, 33.333% * 0.65) - if both dvdcover and momentum in bottom quintile, then: (15% dvd cover score= 35% PX momentum score, 66.667% * 0.5 DY3-month, 33.333% * 0.5)

This portfolio uses price momentum and dividend cover ratio as filters to the dividend yield. This rewards sustainability in dividend paymensts and avoids comapnies that companies that can not afford to pay shareholders dividends thus avoid reactionary capital gain losses.

5.3.2. DIVI2

Rank score (i.e. between 0 and 100):

We use the dividend as the only signal. Similar to Divi1 its a blend of forwarding looking

metrics. That is, 2/3 DY (3m fwd) and 1/3 DY (9m fwd).

This is our vanilla dividend yield portfolio i.e. just ranks according to the highest dividend payers.

5.3.3. DIVI3

Rank score (i.e. between 0 and 100):

We use the P/E ratio as the alternative proxy to value.

5.3.4. DIVI4

Rank score (i.e. between 0 and 100) calculated using:

Using: DPS_Growth_1Y = 40%, DPS_Growth_3Y = 30%, Fwd_3 = 20%, Fwd_9 = 10%

Our dividend growth portfolio using trailing dividend growth rates coupled with 3 and 9 month forward measures.

5.4. Data

Our metric of interest in this study is the excess return of dividend portfolios over the period 04/01/01–06/30/23, with the start date and the end date purely driven by data availability on the selected dividend indices at the time of writing. We obtained historical daily price data of the dividend portfolios from Bloomberg[4]. We also retrieved geographic specific data on index on volatility and interest rates to segment some of our analysis to reflect market cycles and interest rate regimes performane. That is, Chicago Board of Options Exchange (CBOE) VIX Index for the US and EM, V2X for Europe, IVUK for UK and JALSH VR for SA volatility proxies. For interest rate data we considered policy rates for central banks for instruments geography within our study, thse are the Federal Fund rate for the US and EM, Minimum Deposit Financing Rate for the EU, Bank of England Bank Rate and the South African Reserve Bank Repo rate. To this end, we calculate our excess returns, we geometrically chain the excess returns for the different periods before annualizing. This produces comparable cumulative annualized excess return (CAER) results, defined as:

$$CAER = \left[\prod_{t=1}^{n} (1 + ER_t)\right]^{\frac{222}{n}} - 1$$

Our rule to identifying volatility periods either high volatility (Hi-vol) or low volatility (Lo-vol) is achieved by computing the top and bottom quantile in standard deviation for our respective proxies. We then pull the dates corresponding to the periods, and compute annualized returns

[4]see **??** for a detailed guide to indices used and codenames used later in the results and analysis

after geometrically chaining the monthly returns. The amount of daily data for the respective interest rate cycles is large enough to annualized, however, when the VIX, V2X or JALSH RV breach the top or bottom quintile for less than 50 trading days, the period is excluded in order to avoid annualizing small samples. To stratifying between Hiking, Cutting and Neutral interest rate cycles we define these periods as either 5 quarters of changes (upwards for Hiking and downwards for Cutting) or otherwise if central bank held interest rates constant.

6. Empirical Results

6.1. When Do Dividend Strategies Work

The data presented in Table 6.1 presents the excess cumulative returns of our globally traded dividend portfolios of which cumulative returns are indexed and start from value 1. On an aggregate level, most portfolios yield a positive premium but below their starting point in comparison to their corresponding market indices. Nevertheless, a nuanced examination reveals a discernible variance in performance between the high yield (HY) and dividend growth (DG) strategies. From the UK proxy for dividend strategies, the UK_HY surpasses its comparables, delivering a cumulative return of 5.1 times the initial investment over the sample period. In other regions, most high yield and growth strategies fail give consistent cumulative returns from the inception. It's pertinent to underscore, however, gains exhibited bu other indicies other than the UK_HY represent marginal gains when contextualized within a 20-year investment horizon. Therefore, upon assessing the cumulative returns, it becomes evident that there is not a consistent indication that dividend strategies, irrespective of their specific approach or geographical orientation, can consistently procure a premium that, over time, translates into substantive value for investors.

	Regions	Years	Median	Cumulative Excess Return	Stan dev
1	EM_HY	20.00	0.73	0.73	0.10
2	EU_DG	20.00	0.82	0.86	0.10
3	EU_HY	20.00	0.98	1.03	0.05
4	JP_DG	20.00	0.92	0.90	0.17
5	JP_HY	20.00	0.68	0.83	0.10
6	SA_DG	20.00	1.05	0.80	0.34
7	SA_HY	20.00	1.14	0.78	0.31
8	UK_HY	20.00	2.38	5.01	1.06
9	UK_HY_B	20.00	1.41	1.53	0.21
10	US_DG	20.00	0.73	0.69	0.10
11	US_HY	20.00	0.92	1.02	0.07
12	W_HY	20.00	0.96	1.09	0.07

Table 6.1: Cumulative Excess Return

We then stratify the excess returns from the dividend portfolios according to distinct interest rate regimes and equity market stability cycles, a more refined understanding emerges regarding the efficacy of dividend signals. Initially, interest rates are categorized into two distinct cycles: the "cutting" cycle and the "hiking" cycle. These cycles are defined by periods wherein sustained rate changes (a minimum of five alterations) manifest at intervals of at least every five quarters. Moreover, both implied and realized equity market volatilities are leveraged to represent various episodes of market stability. Subsequent to this stratification, we engage in

the geometric chaining of the excess returns across these varied periods, which are then annualized. The resultant metric provides a comparative framework for cumulative annualized returns. Table 6.2 shows performance in periods of heightened volatility (Hi Vol) or subdued (Lo vol) market cycles. We immediately notice higher annualized excess returns in Lo vol over Hi vol periods. Specifically, within regions, SA_HY in Hi Vol , UK_HY_B in Lo Vol , US_DG in Lo Vol , EM_HY in Lo Vol , EU_HY in Lo Vol , JP_HY in Lo Vol give the highest annualized excess returns. That is, HY strategies in advanced economies give higher annualized excess returns in low volatile markets over SA. We note that SA and Japan make up the highest returns over the period in either HY or DG.

Name	Market Period	Months	Annualized Return (%)
UK_HY_B	High Vol	36	8.70
EU_HY	High Vol	36	5.40
EU_DG	Low Vol Period	55	3.53
EM_HY	Low Vol Period	69	3.33
SA_DG	Low Vol Period	44	3.24
SA_HY	High Vol	39	2.74
JP_DG	High Vol	58	2.52
JP_HY	High Vol	58	0.37
EM_HY	High Vol	58	0.08
EU_HY	Low Vol Period	55	-0.11
JP_HY	Low Vol Period	69	-0.28
US_HY	High Vol	58	-0.35

Continued on next page

Name	Market Period	Months	Annualized Return (%)
US_DG	High Vol	58	-0.68
W_HY	High Vol	58	-0.69
US_DG	Low Vol Period	69	-0.76
W_HY	Low Vol Period	69	-1.22
SA_HY	Low Vol Period	44	-1.99
US_HY	Low Vol Period	69	-2.42
UK_HY_B	Low Vol Period	55	-3.63
SA_DG	High Vol	39	-4.07
EU_DG	High Vol	36	-4.84
JP_DG	Low Vol Period	69	-6.46
UK_HY	Low Vol Period	55	-7.20
UK_HY	High Vol	36	-24.01

Table 6.2: Volatility Stratification

Table 7.1 presents the performance metrics of various dividend portfolios across different interest rate regimes, encompassing Hiking, Cutting, and Neutral phases. The Federal Reserve Funds Rate serves as a representative metric for the interest rate regime in emerging markets, given the recognition that interest rate shifts in the US influence risk appetites, thus determining capital flows between advanced and emerging economies. For other indices, the local central bank interest rate cycles are employed to ascertain their corresponding interest rate regimes. Japan stands as an anomaly among these economies; absent distinct hiking or cutting cycles, its central bank largely maintained constant rates. Consequently, we assess its performance

exclusively within the confides of a neutral interest rate cycle[5].

Name	Market Period	Quarters	Annualized Return (%)
EM_HY	Neutral	20	-7.88
EM_HY	Cut	15	-2.73
EM_HY	Hiking	36	2.81
EU_DG	Neutral	29	3.37
EU_DG	Cut	14	6.15
EU_DG	Hiking	27	1.12
EU_HY	Neutral	29	-1.07
EU_HY	Cut	14	-0.87
EU_HY	Hiking	27	-2.01
JP_DG	Neutral	49	1.29
JP_HY	Neutral	49	1.88
SA_DG	Cut	27	-6.77
SA_DG	Hiking	39	1.10
SA_HY	Cut	27	-7.48
SA_HY	Hiking	39	1.74
UK_HY	Neutral	22	-14.72
UK_HY	Cut	19	-25.36
UK_HY	Hiking	30	-34.58
UK_HY_B	Neutral	22	-2.91
UK_HY_B	Cut	19	-13.11

Continued on next page

[5]we exclude results that have cycles less than 5

Name	Market Period	Quarters	Annualized Return (%)
UK_HY_B	Hiking	30	-27.06
US_DG	Neutral	20	-3.32
US_DG	Cut	15	13.40
US_DG	Hiking	36	3.19
US_HY	Neutral	20	-8.83
US_HY	Cut	15	0.05
US_HY	Hiking	36	-2.51

Table 6.3: Performance in Interest Rate Regimes

Within geographies then, EM_HY (Hiking), EU_DG (Cutting), JP_HY (Neutral),SA_DG (Hiking), UK_HY_B(Hiking), US_DG(Hiking), perform well in Hiking periods but their strategies are evenly split given our sample. Therefore, there is no clear indication of which strategy works best given the interest rate regime.

Investors are always considered with consistency when determining how to allocate capital. For this we consider the information tratio. Figure 6.1 illustrates the consistency in the performance of dividend portfolios by employing the rolling information ratio. The information ratio serves as a measure of a portfolio's performance relative to a market benchmark. It is frequently used in the industry to gauge a manager's proficiency in generating excess returns and the consistency with which these returns are achieved. Thus, our objective is to assess the capacity of our dividend portfolios to achieve such excess returns. We have adopted a rolling 60-month information ratio as a metric to evaluate long-term performance consistency. This ratio is

computed by determining the rolling excess return of the index relative to its benchmark and then dividing this by the volatility of those excess returns.

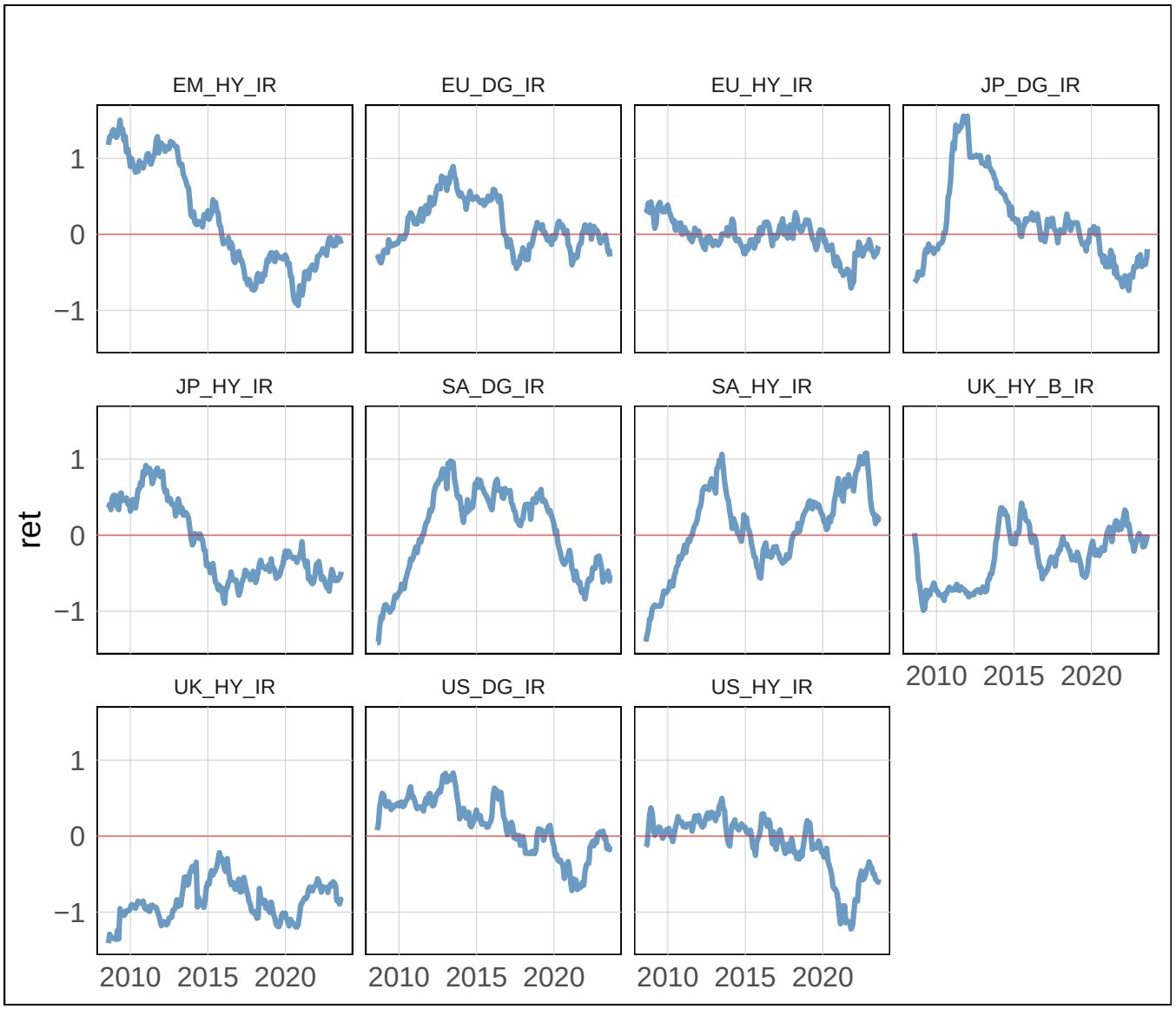


Figure 6.1: Rolling 3 Year Returns

Suppose we consider the red line to be a measure of a startegy delivering acceptable returns over time. From this metric we notice that the UK_HY has delivered undesirable consistency

in returns over the sample period, thus had struggled to give the bang for buck effect and harvest premiums for value equity overtime. The emerging market and Japan portfolios had a polarizing performances throught the sample period. For one, from 2005 to 2015, returns for the portfolio were consistently positive. Since then, over the last 8 years rolling returns for these portfolis have been negative. This contrasts South African portfolios, of which dividend growth portfolios have since 2010 to 2020 have shown psotive information ratios. The SA_HY only turned positive since 2017. US and EU indexes have mirror intra geography performance. In line with the results from our stratification based on market cycles and interest rate regimes, we observed that the majority of HY experienced declines in rolling information ratios, while DG portfolios incurred losses. This trend was particularly evident during the period following the global financial crisis in late 2008 to late 2009. This period was characterized by high volatility and falling interest rates. Conversely, the subsequent crisis, which occurred after the COVID-19 pandemic and was marked by rising interest rates, favored SA , JP and EM, a (SA). These observations align with the major findings on the influence of interest rates from the previous section.

Drawdowns give a more detailed picture of the risk attributes of the constituents of a data series. Their importance for our study is to uncover latent relationship between performance and drawdown.

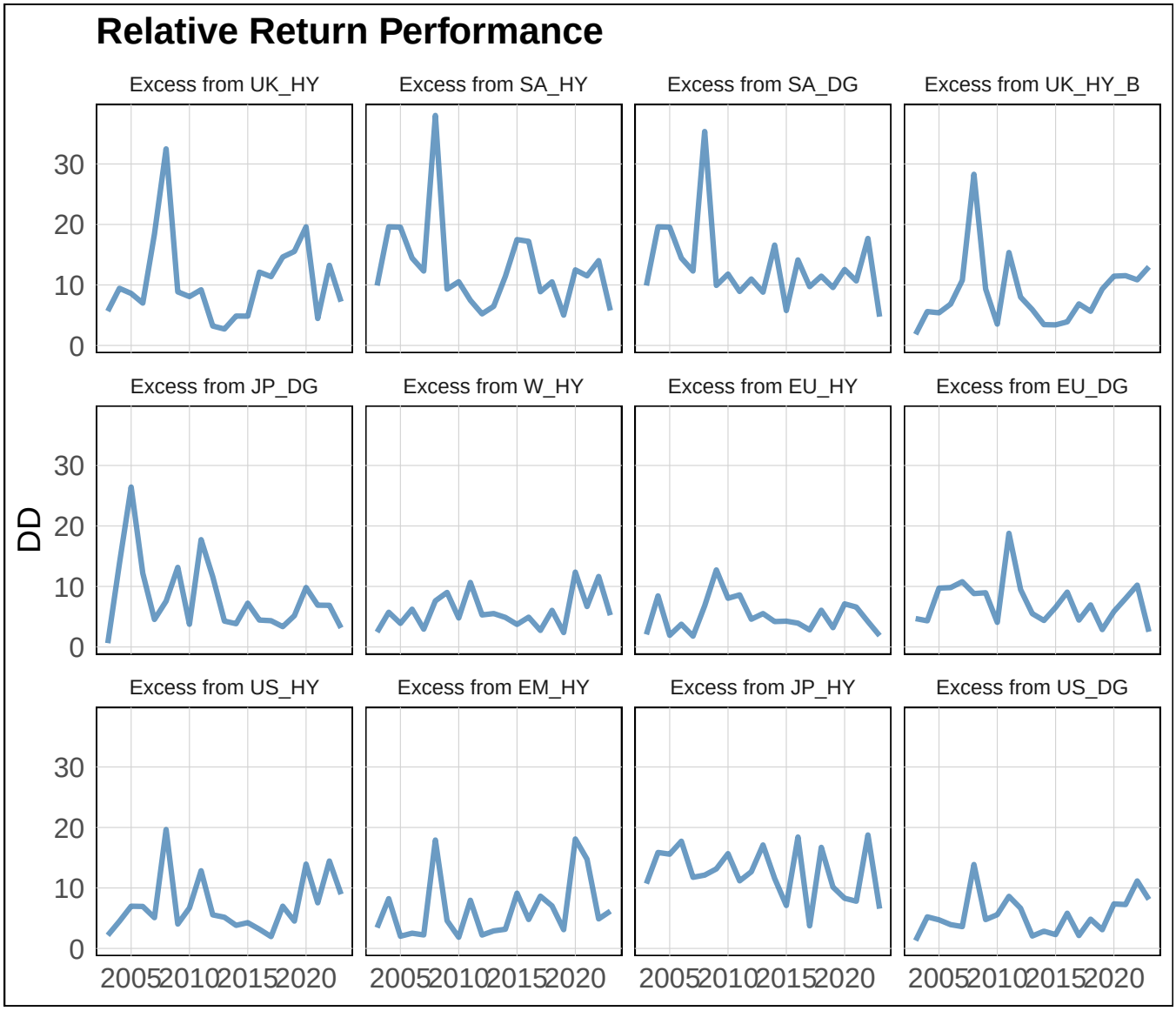


Figure 6.2: Rolling 3 Year Returns

Our analysis in **??**fig2] defines as the disparity between the peak and trough values of cumulative excess returns within a specified time frame. When scrutinizing our dividend portfolios, a pattern of similarity emerges both geographically and across varied strategies.The SA portfolios were markedly volatile, displaying the most pronounced draw downs visually and more

concretely by value from the beginning of the sample period. This is closely followed by the UK High Yield (HY) strategies. In contrast, portfolios associated with the EU and US exhibit relatively milder draw downs. Yet, when the focus shifts from mere magnitude to the distribution or dispersion of these drawdowns, the narrative undergoes a transformation. The UK High Yield and Japan High Yield strategies are revealed to be more volatile, being susceptible to significant fluctuations. In juxtaposition, emerging markets, with South Africa as a case in point, manifest a more stabilized profile, evidenced by diminished variation in their drawdowns.

7. Application to South Africa

7.1. Backtest Results from Dividend Portfolio Signals

Figure 7.1 illustrates the cumulative returns of our dividend portfolios, each accompanied by a display of the total capital invested during the sample period. The portfolio categories consist of those structured around Dividend Yield (DY), Dividend Growth (DG), Price Momentum, and Sustainability, all of which are juxtaposed with the performance benchmark represented by the SWIX Top 40 index.In line with our earlier analysis of the SA_HY and SA_DG portfolios, a discernible pattern emerges where the returns over the sample period fall short of the benchmark set by the market index. Furthermore, our vanilla portfolio, the Dividend High Yield (HY), exhibits the lowest cumulative returns. Likewise, the Price Momentum and Sustainability portfolios demonstrate diminished performance compared to both the Value and DG portfolios. This observation underscores a trend of under performance in our portfolios when evaluated against the broader market index. This result warrants further examination and investigation to discern the underlying factors and potential implications within the context of dividend-oriented investment strategies.

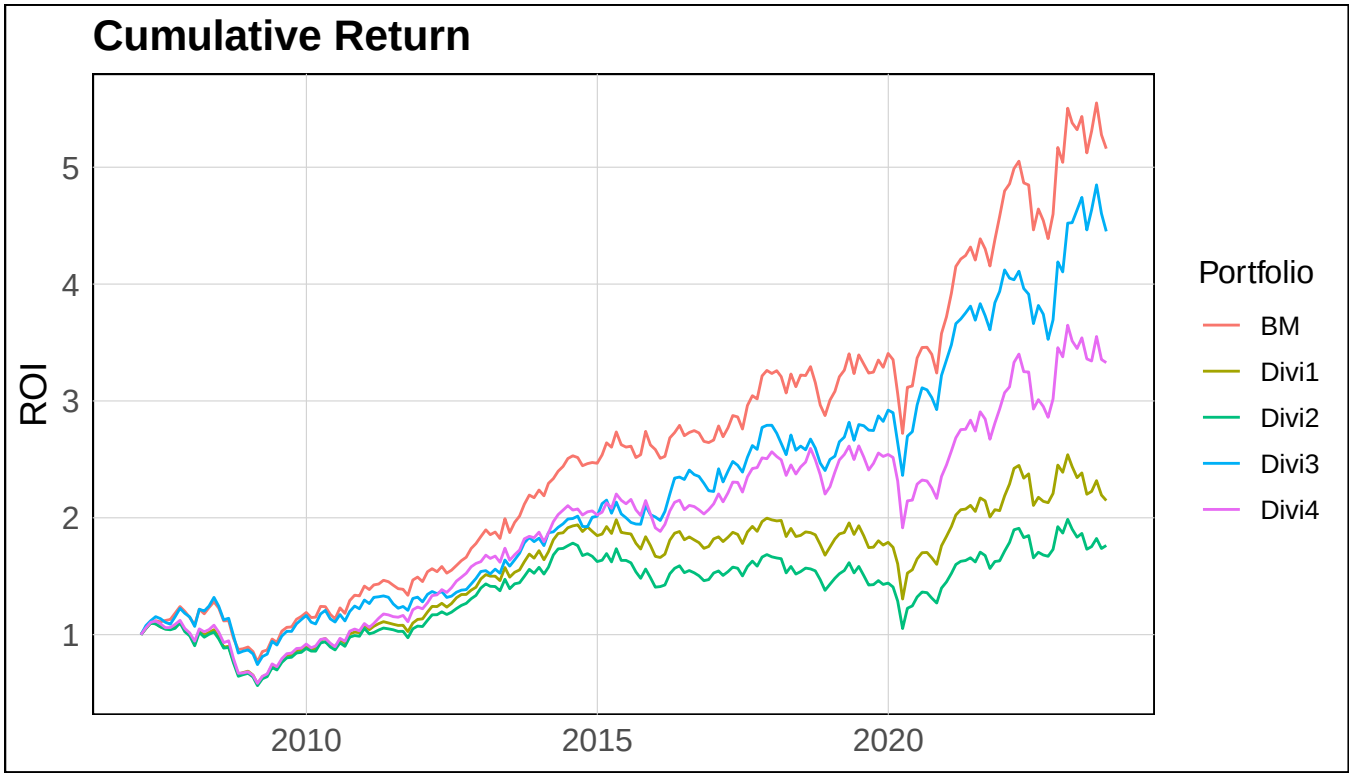


Figure 7.1: Rolling 3 Year Returns

Tables 7.1 and 7.2 provide a comprehensive breakdown of total investments during periods characterized by high interest rate volatility and distinct interest rate regimes. These periods are categorized as either high or low volatility, and they pertain to hiking or cutting cycles in response to the realized volatility and the interest rate regime of the market proxies. Specifically, we designate a period as "high volatility" when these measures fall below (above) the lowest (highest) quintile for at least 50 trading days and 5 quarters.However, mirroring our findings from internationally traded portfolios, we once again observe the advantageous qualities of dividend portfolios when stratified according to interest rate regimes and volatility levels. Notably, the dividend portfolios exhibit notable defensive attributes, with the price momentum-adjusted

and sustainability portfolios yielding the highest returns during hiking periods and times of high volatility. Moreover, it is worth highlighting that our portfolios consistently outperform the market index during these periods.

	Portfolio	Total ROI %	Annualized ROI%	SD	MarketCycle	Total ROI
1	BM	1.06	-0.70	0.02	High Volatility	
2	Divi1	1.02	-0.82	0.03	High Volatility	
3	Divi2	1.04	-0.78	0.03	High Volatility	
4	Divi3	1.00	-0.86	0.01	High Volatility	
5	Divi4	1.06	-0.72	0.04	High Volatility	
6	BM		227.80	0.08	Low Volatility	1.83
7	Divi1		-0.25	0.06	Low Volatility	1.13
8	Divi2		1.74	0.05	Low Volatility	1.26
9	Divi3		13.27	0.08	Low Volatility	1.45
10	Divi4		70.51	0.09	Low Volatility	1.66

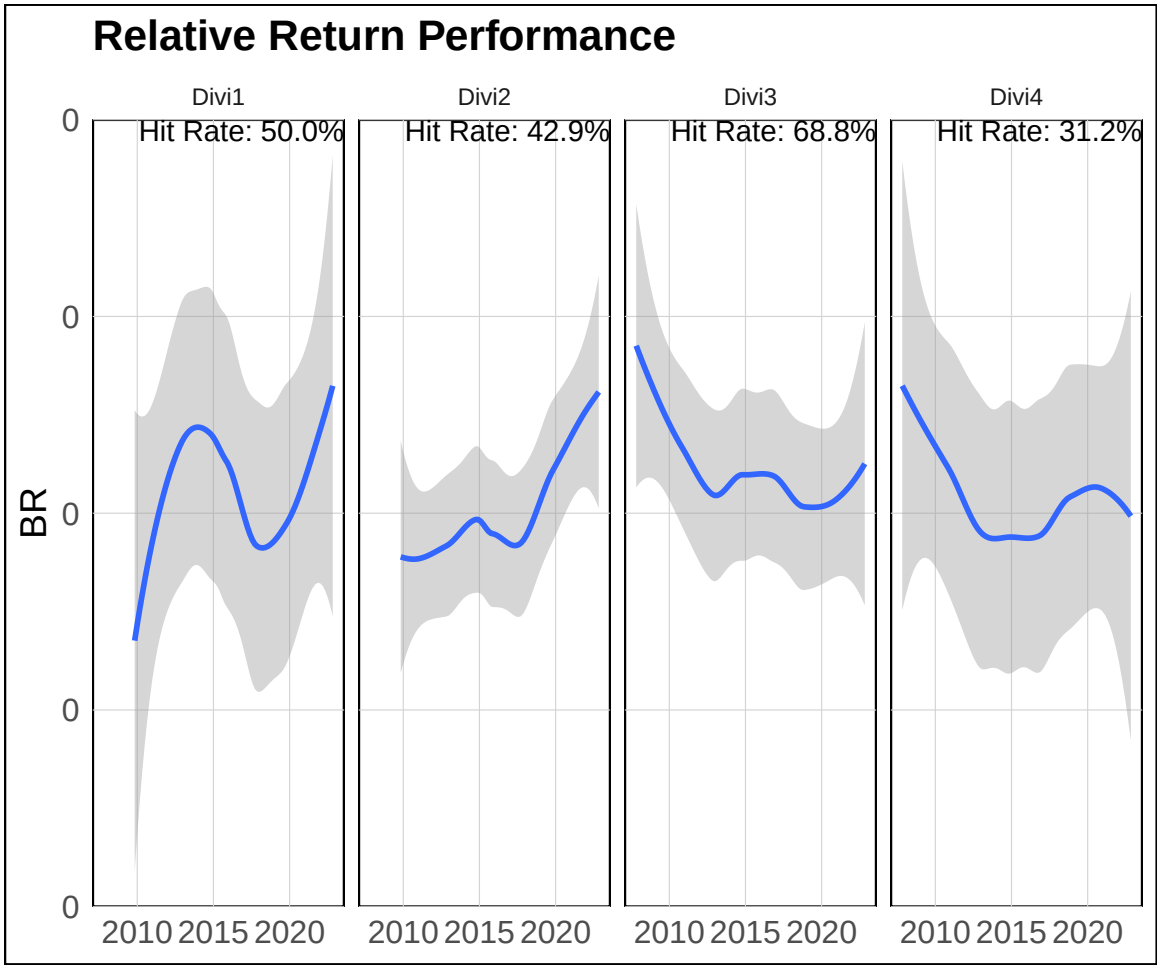
Table 7.1: Market Cycle Perforomance

Nevertheless, during cutting cycles or in times of low volatility, we note a departure from this trend. In these scenarios, much like the overall return on investment, the market index appears to offer higher returns. Intriguingly, among our portfolios, it is the dividend yield (HY) portfolio that fails to deliver substantial returns compared to our other dividend-oriented strategies.This multifaceted analysis underscores the nuanced relationship between interest rate dynamics, market volatility, and the performance of different investment strategies, shedding

light on the defensive characteristics of dividend portfolios in select economic environments while highlighting the contextual significance of interest rate fluctuations.

	Portfolio	Total ROI	Ann.roi	SD	MarketCycle	Annualized ROI%
1	BM	0.16	-1.00	0.01	Hiking	
2	Divi1	0.67	-0.99	0.07	Hiking	
3	Divi2	0.41	-1.00	0.06	Hiking	
4	Divi3	0.32	-1.00	0.02	Hiking	
5	Divi4	0.20	-1.00	0.03	Hiking	
6	BM	3.41		0.26	Cutting	6.15
7	Divi1	1.22		0.12	Cutting	-0.88
8	Divi2	1.48		0.15	Cutting	-0.74
9	Divi3	1.95		0.14	Cutting	-0.24
10	Divi4	2.51		0.23	Cutting	1.07

Table 7.2: Interest Rate Regime Performance


Relative Return Performance
Divi1
Divi2
Divi3
Divi4
Hit Rate: 50.0%
Hit Rate: 42.9%
Hit Rate: 68.8%
Hit Rate: 31.2%
BR
0
0
0
0
2010 2015 2020
2010 2015 2020
2010 2015 2020
2010 2015 2020

8. Conclusion

Over time, dividend portfolios, whether HY or DG, have exhibited positive excess returns as indicated by cumulative returns. While the UK_HY index has shown the highest cumulative return, this trend is not consistently observed across other regional indexes. Consequently, when assessing the aggregate perspective on investor portfolio value, dividend portfolios may not offer a reliable means to capture the value premium consistently. However, upon stratifying these portfolios according to different periods of market volatility, it becomes evident that during low volatility periods, the primary determinant of performance is not the geographical region but rather the specific investment strategy employed. In this case, HY strategies. Surprisingly, portfolios based in South Africa (SA) tend to perform well during these high volatility periods, which is somewhat unconventional as such times are typically associated with a flight to safety, and Emerging Markets (EM) and, by extension, South Africa, are considered riskier. When extending our analysis to encompass interest rate cycles, we observe a contrasting effect compared to the volatility-based stratification. We find that all strategies appear to give the highest return in hiking cycles.

In assessing consistency, we employ the information ratio. Initially, we discern that, at a broad level, dividend portfolios do not consistently maintain a positive ratio over an extended investment horizon. However, disparities in performance emerge. Notably, South African (SA) and dividend indexes have consistently delivered positive ratios over the past decade. In contrast, Emerging Markets (EM) and Japanese (JP) indexes have experienced substantial declines in their information ratios, despite seemingly consistent performance prior to 2015.

Meanwhile, the United States (US), European Union (EU), and United Kingdom (UK) indexes have exhibited unpredictable performance over the sampled period.

When we integrate our information ratio findings with drawdown analysis, we observe that advanced economies have experienced the fewest drawdowns over the sample period, with the exception of the UK. This could suggest a relatively lower level of systematic risk in these economies. Conversely, South African (SA) and Emerging Market (EM) drawdowns have exhibited a declining trend, possibly indicating a reduced perception of risk in emerging markets over time.

9. Appendix

9.1. Globally Traded Dividend Portfolios Considered

TICKER	NAME	Codename	Inception Date
FUDP	FTSE UK Dividend+ Index	UK_HY	
M2EFDY	MSCI EM HY Gross Total Return USD Index	EM_HY	
M2GBDY	MSCI UK HY Gross Total Return USD Index	UK_HY	
M2JPDY	MSCI Japan HY Gross Total Return USD	JP_HY	
M2USADVD	MSCI USA HY Gross Total Return USD Index	US_HY	
M2WDHDVD	MSCI World HY Gross Total Return Total Return USD Index	W_HY	
SPDAEET	S&P EU 350 Dividends Aristocrats Total Return Index	EU_DG	
SPJXDAJT	S&P/JPX Dividend Aristocrats Total Return Index	JP_DG	
SPDAUDT	S&P 500 Dividend Aristocrats Total Return Index	US_DG	
SPSADAZT	S&P South Africa Dividend Aristocrats Index ZAR Gross TR	SA_DG	
TJDIVD	FTSE/JSE Dividend+ Index Total Return Index	SA_HY	
M2EUGDY	MSCI Europe Ex UK HYGross Total Return USD Index	EU_HY	
TUKXG	FTSE 100 Total Return Index GBP	UK	
GDUEEGF	MSCI Daily TR Gross EM USD	EM	
GDDUUK	MSCI UK Gross Total Return USD Index	UK_B	
TPXDDVD	Topix Total Return Index JPY	JP	
GDDUUS	MSCI Daily TR Gross USA USD	US	
GDDUWI	MSCI Daily TR Gross World USD	W	
SPTR350E	S&P Europe 350 Gross Total Return Index	EU_2	
SPXT	S&P 500 Total Return Index	JP	
SPXT	S&P 500 Total Return Index	US_2	
JALSH	FTSE/JSE Africa All Share Index	SA	
JALSH	FTSE/JSE Africa All Share Index	SA	
GDDUE15X	MSCI Daily TR Gross Europe Ex UK USD	EU	

Table 9.1: Index Description

9.2. Stratified Periods Considered

9.3. Dividend Defintions

Bloomberg has two main categories for distributions: Cash Dividends and Stock Dividends. Various kinds of distributions appear under these definitions that do not necessarily only apply to ordinary issued shares (the only security type that we consider in our study). In the next two subsections we define the types of distributions that fall under these categories and in some cases provide additional information. Our sample only comprises of final, interim and regular cash dividends. These dividends are categorized by Bloomberg as Normal Cash.

9.3.1. Cash Dividends

- Final: dividend declared for the financial year-end
- Interim (includes 2nd interim, 3rd interim and 4th interim): dividend paid after a reporting period (eg. quarterly or semi-annually) Special Cash: dividend declared for the financial year-end or interim period over and above the normal dividend
- Regular Cash: a dividend distribution made in cash
- Omitted: A company has elected to skip a scheduled payment
- Discontinued: The discontinuance of dividend payments on an ongoing basis
- Interest on Capital: interest paid on fixed income instruments
- Income: mutual fund dividends, in most cases
- Liquidation: a distribution of a companies assets to shareholders during (interim) or after delisting (final)

- Return of Capital: a non-taxable cash payment to investors from the company that represents a return on invested capital as opposed to a dividend
- Memorial: a special dividend. For example a company celebrating an anniversary might pay a memorial dividend
- Proceeds from sale of shares: a distribution of cash to shareholders after selling shares. For example this may occur when the company sells the shares of a shareholder who was not eligible to receive shares in an offering and then distributes the proceeds to shareholders
- Cancelled: the cancellation of a previously declared dividend
- Return Premium: special cash dividend paid from a special reserve
- Preferred Rights Redemption: a company pays a dividend in exchange for previously issued preferred rights

9.4. Stock Dividends

Bonus: also known as a scrip or capitalization issue. Shareholders are given additional stock in proportion to their holdings - Scrip: a free issue or bonus of shares - Stock Dividend: portion of a company's retained earnings that are distributed to shareholders in stock. The JSE treats stock dividends as a capitalization issue

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