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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 proposed approach aims to valuable insights based on risk and return for systematically constructed dividend portfolios. What follows is a refinement of our subset approach to local data construct to construct back-tests from high dividend payers.

Portfolio construction

- we refine the Modern Portfolio Theory, which defines risk as a varinace σ^2 of its returns r_t .
- by decomposing variance to be a decomposition into its into common factor and specific return .
- from these returns we create a factor covariance matrix. Defined as $XFX^T + D$ where, n assets to select an optimum portfolio and 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.

- periodically, we calculate each asset exposure to the common factors calculated in the factor covariance matrix. This then help us compute the forecast of the level of each asset specific risk.
- the short term risk forecasts will then be used to gauage contribution of each asset to a portfolio over risk which contributes to the portfolio construction process.
- our measure of 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).

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

Constraints - we use a 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, inclusion is by market capitalization and liquidity. We use the Capped SWIX and the portfolio is re-balanced quarterly. - Moreover, we will include active risk constraints to parent benchmark 5% -has a +/-10% sector exposure limit ; holds no property stocks in the portfolio - has a 15% max single stock exposure limit - has a 10% quarterly turnover limit

Dividend Signals

We construct our dividend portfolios using the following signals:

Divi1: Rank score (i.e. between 0 and 100) calculated using: Conditional signal: 2/3 DY (3-month forward); 1/3 DY (9-month forward) 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)

Divi2: Using just: 2/3 DY (3moonth forward); 1/3 DY (9month forward)

Divi3: Using just P/E as the signal

Divi4: Using: DPS_Growth_1Y = 40%, DPS_Growth_3Y = 30%, Fwd_3 = 20%, Fwd_9 = 10%

DPS_Growth_1Y definition