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ENHANCING THE INVESTMENT PERFORMANCE OF YIELD-BASED STRATEGIES

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Enhancing the Investment Performance of Yield-Based Strategies

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Dividend payments have been on a systematic decline since 1972. In our sample, the percentage of firms paying a dividend has declined from 63.8% in 1972 to 30.4% in 2011. Our observation agrees with the results found in Fama and French [2001]. Fama and French find that even after controlling for firm characteristics, firms have become less likely to pay dividends. The decline in dividend payments has spurred many researchers to address the question of whether or not dividend yields continue to predict returns. Boudoukh et al. [2007] find that dividend yield does a poor job predicting future returns in a sample that runs from 1972 through 2003. In addition, Goyal and Welch [2003] find that dividend yield has little predictive ability out of sample. Given the lackluster performance of dividend yield to predict returns, the goal of this article is to determine how to enhance yield-based investment strategies.

Our work is most closely related to Boudoukh et al. [2007]. Boudoukh et al. proposed two alternative measures of shareholder yield to use in place of dividends: 1) dividends plus repurchases (PAY1) and 2) dividends plus *net* repurchases (PAY2). Over the 1972–2003 period, the PAY1 and PAY2 alternative payout measures perform better than dividend yield. We extend the analysis conducted by Boudoukh in two ways: 1) We investigate a shareholder yield measure that includes net-debt paydown as part of the yield calculation (SHYD), and 2) we conduct a comparative analysis of yield-based investment strategies to identify the strategy that is most beneficial for investors.

Net-debt paydown yield is measured as the year-over-year difference in the debt load of a firm, scaled by total market capitalization: in other words, a measure of the willingness and ability of a firm's management to pay down debt with free cash flow. To date, nobody to our knowledge has rigorously analyzed net-debt paydown as a possible mechanism to enhance yield-based investment strategies. We include net-debt paydown yield in our new payout metric to identify the expected costs of firm agency problems associated with free cash flow. A primary implication from the Jensen and Meckling [1976] and Jensen [1986] firm-agency models is that firms with more profitable assets in place will commit a larger fraction of their pre-interest earnings to debt payments and dividends, in order to control the agency costs created by free cash flow. In the context of our research, agency theory would suggest that investors might want to look for firms that pay down debt, in addition to paying out dividends or repurchasing shares. Managers who pay down debt with free cash flow send a strong signal that operations are promising and agency costs are limited.

The addition of net-debt paydown to the PAY2 yield improves investment performance. Over the 1972–2011 period, firms with the highest SHYD measures earn an average monthly return of 1.3% and a statistically significant three-factor alpha of 25.3 bps a month. This compares favorably with the simple dividend yield strategy (DIV), which earns an average 1.18% monthly return and has a statistically insignificant alpha of 16.5 bps a month.

Our robustness results look at different time periods and the inclusion/exclusion of financials. The simple dividend yield strategy, DIV, is a relative underperformer to more inclusive yield measures—PAY1, PAY2, and SHYD—when financials are excluded from the analysis; however, when financials are included, the DIV strategy is an *extreme* underperformer relative to the comprehensive yield metrics.

The various yield metrics perform differently during different subperiods. For example, PAY1, PAY2, and SHYD have outperformed the simple dividend yield strategy in three out of the four past decades. SHYD is the top performer in virtually all subsample periods and when financials are included or excluded, suggesting that the addition of net-debt paydown in the yield metric is a robust improvement to high-yield investment strategies.

DATA

Our data sample includes all firms on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX), and NASDAQ with the required data on CRSP and Compustat. We examine only firms with ordinary common equity on CRSP and eliminate all REITs, ADRs, closed-end funds, and financial firms (except where indicated). We incorporate CRSP delisting return data using the technique of Beaver, McNichols, and Price [2007]. To be included in the sample, all firms must have a non-zero market value of equity as of June 30 of year *t*. This market capitalization on June 30 is the denominator in each yield measure described here. We construct our yield measures according to the following formulas:

- *Dividend Yield (DIV)*: Common dividends (DVC)/Market capitalization.
- *Payout CF Yield (PAY1)*: We construct repurchase cash flow similar to Boudoukh et al. [2007], with Repurchase cash flow = purchase of common and preferred stock (PRSTKC) + any reduction in the value of preferred stock or redemption value (PSTKRV); PAY1 = [Repurchase cash flow + DVC]/Market capitalization.
- *Net Payout CF Yield (PAY2)*: We construct equity issuances similar to Boudoukh et al. [2007], with Equity issuances = sale of common and preferred stock (SSTK) – any increase in the value of the net number of preferred stocks outstanding (PSTKRV); PAY2 = [Repurchase cash flow + DVC – Equity issuances]/Market capitalization.
- *Shareholder Yield (SHYD)*: First, we compute debt reduction using total long-term debt (DLTT) and total debt in current liabilities (DLC), as follows: Debt reduction = $[DLTT_t + DLC_t] - [DLTT_{t-1} + DLC_{t-1}]$. Then, SHYD = [Debt reduction + Repurchase cash flow + DVC – Equity issuances]/Market capitalization.

Since the repurchase and issuance data from the statement of cash flows began in 1971, we start our return series in July 1972. Stock returns are measured from July 1972 through December 2011. Firm size (e.g., market capitalization) is determined by the June 30 value of year *t*. Firm fundamentals are based on December 31 of year $t - 1$ (for firms with fiscal year-ends between January 1 and March 31, we use year *t* fundamentals; for firms with fiscal year-ends after March 31, we use year $t - 1$ fundamentals). Firms are sorted into quintiles on each yield measure on June 30 of year *t,* and this value is used to compute the monthly returns from July 1 of year *t* to June 30 of year $t + 1$. All returns reported have a value-weight portfolio construction. We perform all analysis with equal-weight portfolio construction; the key conclusions from our analysis are even stronger when looking at equal-weight portfolios.

Exhibit 1 tabulates the descriptive statistics for the universe of stocks used in our tests; the results do not include financial firms. MVE is the market value of equity in thousands of dollars on June 30 of year *t*. B/M is the book value of equity scaled by MVE. Data on book value of equity are taken from Compustat from the firm's most recent annual report. Past1 Return is the return during June of year *t*, and Past12 Return is the buy-and-hold return from June 30 of year $t - 1$ to May 31 of year *t*. Illiquidity is the Amihud [2002] measure

EXHIBIT 1
Summary Statistics

	N	Mean	Median	Std. Dev.	Min.	Q1	Q3	Max
Panel A: Full Sample								
MVE	177,253	1,268	77	8,653	0	18	400	524,352
B/M	177,253	0.760	0.569	2.213	–277.415	0.269	1.041	185.670
Past1 Return	175,934	0.006	0.000	0.175	–1.000	–0.077	0.068	9.400
Past12 Return	177,253	0.133	0.000	0.693	–0.998	–0.200	0.308	44.538
Illiquidity	177,253	7.899	0.154	114.849	0.000	0.007	1.843	38,095.240
Panel B: Dividend Payers								
MVE	65,481	2,515	206	12,757	0	42	1,002	524,352
B/M	65,481	0.913	0.741	1.182	–24.831	0.424	1.171	164.276
Past1 Return	65,289	0.010	0.004	0.104	–0.726	–0.046	0.058	1.828
Past12 Return	65,481	0.157	0.085	0.443	–0.981	–0.079	0.317	11.703
Illiquidity	65,481	1.477	0.041	9.883	0.000	0.002	0.470	765.903
Panel C: High Yield								
MVE	13,091	1,648	171	7,618	0	37	792	234,445
B/M	13,091	1.385	1.136	2.264	–24.831	0.801	1.592	164.276
Past1 Return	13,045	–0.003	0.000	0.095	–0.726	–0.043	0.042	1.524
Past12 Return	13,091	0.037	0.023	0.300	–0.981	–0.112	0.186	5.911
Illiquidity	13,091	2.053	0.053	14.869	0.000	0.004	0.573	765.903
Panel D: Low Yield								
MVE	13,079	2,428	216	11,671	1	45	1,018	447,719
B/M	13,079	0.559	0.421	0.525	–16.377	0.253	0.712	9.084
Past1 Return	13,007	0.023	0.010	0.127	–0.686	–0.050	0.083	1.828
Past12 Return	13,079	0.317	0.179	0.652	–0.906	–0.030	0.522	11.703
Illiquidity	13,079	1.063	0.025	6.161	0.000	0.001	0.315	349.256

Notes: The sample consists of all non-financial firms that have a positive market value of equity on June 30 of each year. Panel A includes the entire sample; panel B includes only firms that pay dividends; panel C includes the sample of firms in the highest-yield quintile among dividend payers; panel D includes the sample of firms in the lowest-yield quintile among dividend payers. The sample period is from July 1, 1972, through December 31, 2011. Portfolios for each strategy are rebalanced each year on July 1 and are held from July 1 of year t until June 30 of year t + 1. MVE is the market value of equity in thousands of dollars on June 30 of year t. B/M is the book value of equity scaled by MVE. Data on book value of equity is taken from Compustat using data from the firm's most recent annual report. Illiquidity is the Amihud [2002] measure of illiquidity defined as the average ratio of the daily absolute return to the dollar trading volume, measured over a 12-month period prior to the portfolio formation. Past1 Return is the buy-and-hold return during the month preceding the portfolio formation (June of year t), and Past12 Return is the buy-and-hold return during the 12 months before the portfolio formation month excluding month t – 1 (July 1 of year t – 1 until May 31 of year t). Stock price data to calculate returns are from CRSP.

of illiquidity defined as the average ratio of the daily absolute return to the dollar trading volume, measured over a 12-month period from July 1 of year $t-1$ to June 30 of year t.

Panel A of Exhibit 1 presents statistics for the entire sample; Panel B is only firms that pay dividends; Panel C is the sample of firms in the highest-yield quintile among dividend payers; Panel D is the sample of firms in the lowest-yield quintile among dividend payers. Dividend-paying stocks are generally larger, have higher B/M, and are more liquid than the full universe of firms. Higher-yield dividend-paying stocks tend to be smaller, cheaper, and less liquid than lower-yield dividend-paying stocks.

RESULTS: COMPARING YIELD METRICS

Exhibit 2 shows the value-weight returns to portfolio quintiles formed on high-yield (quintile 5) and low-yield (quintile 1), as well as zero-yield stocks, over the 1972 to 2011 period. We see in Exhibit 2 (Panel A, DIV) that dividend yield alone does not have significant three-factor alpha. Adding repurchases (Panel B, PAY1) creates statistically significant three-factor alpha, while adding net repurchases (Panel C, PAY2) improves three-factor alpha even more, at the margin. Finally, adding net-debt paydown to the yield metric has the highest significant three-factor alpha and the highest average monthly returns (Panel D, SHYD). This initial evidence

EXHIBIT 2
Performance Statistics by Quintile

	Zero Yield	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Panel A: DIV						
Average Returns	0.960	0.813	0.892	0.962	1.066	1.182
Standard Dev.	7.277	5.895	4.975	4.545	4.309	4.019
CAPM Alpha	–0.118	–0.154	0.012	0.126	**0.254**	**0.453**
	0.389	0.121	0.896	0.165	0.004	0.000
Fama-French Alpha	0.020	0.028	0.036	0.084	0.129	0.165
	0.825	0.756	0.689	0.319	0.098	0.085
Panel B: PAY1						
Average Returns	0.877	0.867	0.873	0.971	1.042	1.203
Standard Dev.	7.589	6.349	5.297	4.535	4.262	4.191
CAPM Alpha	–0.222	–0.137	–0.050	0.119	**0.225**	**0.416**
	0.137	0.221	0.518	0.090	0.005	0.000
Fama-French Alpha	–0.094	0.085	0.053	0.119	0.106	**0.171**
	0.337	0.361	0.477	0.080	0.125	0.027
Panel C: PAY2						
Average Returns	1.027	0.523	0.771	0.846	0.987	1.183
Standard Dev.	6.789	6.759	6.653	6.058	4.470	4.148
CAPM Alpha	0.012	**–0.507**	**–0.251**	–0.135	**0.134**	**0.379**
	0.938	0.000	0.048	0.199	0.023	0.000
Fama-French Alpha	–0.063	**–0.432**	–0.039	0.058	**0.125**	**0.206**
	0.594	0.000	0.682	0.513	0.030	0.001
Panel D: SHYD						
Average Returns	1.076	0.690	0.835	0.805	0.989	1.304
Standard Dev.	7.498	5.704	5.240	5.411	4.539	4.608
CAPM Alpha	0.061	**–0.257**	–0.088	–0.128	**0.123**	**0.459**
	0.770	0.010	0.190	0.111	0.012	0.000
Fama-French Alpha	0.204	**–0.457**	–0.109	0.055	**0.196**	**0.253**
	0.236	0.000	0.102	0.392	0.000	0.001

Notes: The zero yield column consists of firms that have a zero yield for the respective yield measure. Only non-zero yield firms are included in the quintile portfolios. We calculate monthly returns to the portfolios and run regressions against linear factor models. Portfolios for each strategy are rebalanced each year on July 1 and are held from July 1 of year t until June 30 of year t + 1. The time period under analysis is from July 1, 1972, to December 31, 2011. Financials firms are excluded. All returns are calculated as value-weight buy-and-hold. The independent variables are the monthly excess value-weight market index returns and returns from the Fama and French factors [1993]. Alphas are in monthly percent, p-values are shown below the coefficient estimates, and 5% statistical significance is indicated in bold. Quintile 5 represents the firms that are in the top quintile for yield. Quintile 1 represents the firms that are in the bottom quintile for yield.

suggests that SHYD is the most effective strategy based on alpha estimates and average returns.

Yield Metric Alternative Performance Metrics

Exhibit 3 presents calculations for common performance assessment metrics. SHYD is the top-performing metric in terms of compound annual growth rate (CAGR), which is 15.36%—111 bps higher than the next highest CAGR calculation (PAY1). All the metrics for the high-yield quintile portfolios show favorable calculations for drawdowns, Sharpe ratios, and Sortino ratios relative to the low-yield quintile portfolios. For example, the high-yield SHYD portfolio has a max drawdown of –43.87, a Sharpe ratio of 0.65, and a Sortino ratio of 0.96, versus the low-yield SHYD portfolio, which has a max drawdown of –62.34, a Sharpe ratio of 0.15, and a Sortino ratio of 0.23.

In general, the performance metrics results are similar across high-yield quintiles for the different yield measures. The evidence suggests that high-yield strategies have historically performed better than low-yield strategies; however, among high-yield metrics, SHYD performs the best in terms of CAGR.

Robustness Tests

Several studies showed that the dividend yield is no longer an effective measure to predict future returns (e.g., Stambaugh [1999], Goyal and Welch [2003], and Boudoukh et al. [2007]). We find conflicting evidence

EXHIBIT 3
Alternative Performance Metrics

	Zero Yield	1	2	3	4	5
Panel A: DIV						
CAGR	8.62%	7.92%	9.61%	10.80%	12.33%	14.06%
Downside Deviation	0.05	0.04	0.03	0.03	0.03	0.03
Sharpe Ratio	0.25	0.22	0.31	0.39	0.50	0.64
Sortino Ratio (MAR = 5%)	0.38	0.33	0.48	0.59	0.73	0.98
Worst Drawdown	–71.75%	–54.24%	–43.50%	–44.19%	–48.11%	–42.60%
Worst Month Return	–31.02%	–27.48%	–24.17%	–24.12%	–21.59%	–13.08%
Best Month Return	25.41%	22.94%	17.62%	18.09%	14.98%	22.75%
Profitable Months	55.91%	57.38%	58.23%	60.76%	61.18%	66.03%
Panel B: PAY1						
CAGR	7.22%	8.24%	9.13%	10.93%	12.03%	14.25%
Downside Deviation	0.05	0.05	0.04	0.03	0.03	0.03
Sharpe Ratio	0.20	0.23	0.28	0.40	0.49	0.63
Sortino Ratio (MAR = 5%)	0.30	0.35	0.42	0.62	0.72	0.90
Worst Drawdown	–79.44%	–64.95%	–46.95%	–40.30%	–44.88%	–45.52%
Worst Month Return	–31.71%	–28.58%	–27.84%	–23.48%	–19.48%	–19.10%
Best Month Return	25.90%	21.77%	19.31%	16.67%	18.94%	24.01%
Profitable Months	54.64%	55.91%	57.59%	60.34%	61.60%	64.98%
Panel C: PAY2						
CAGR	9.94%	3.50%	6.75%	8.19%	11.17%	13.99%
Downside Deviation	0.05	0.05	0.05	0.05	0.03	0.03
Sharpe Ratio	0.30	0.04	0.17	0.23	0.42	0.62
Sortino Ratio (MAR = 5%)	0.44	0.07	0.26	0.32	0.63	0.89
Worst Drawdown	–63.84%	–80.39%	–75.69%	–75.26%	–41.88%	–44.71%
Worst Month Return	–30.92%	–31.41%	–28.54%	–28.28%	–24.05%	–17.62%
Best Month Return	24.37%	18.43%	20.88%	18.30%	14.68%	20.90%
Profitable Months	56.33%	55.91%	56.12%	56.96%	59.70%	66.24%
Panel D: SHYD						
CAGR	9.90%	6.48%	8.68%	8.17%	11.16%	15.36%
Downside Deviation	0.05	0.04	0.04	0.04	0.03	0.03
Sharpe Ratio	0.29	0.15	0.26	0.23	0.41	0.65
Sortino Ratio (MAR = 5%)	0.44	0.23	0.38	0.34	0.62	0.96
Worst Drawdown	–78.92%	–62.34%	–55.72%	–67.12%	–44.66%	–43.87%
Worst Month Return	–31.38%	–28.34%	–25.93%	–24.28%	–21.08%	–19.27%
Best Month Return	29.25%	28.12%	20.94%	19.34%	18.03%	18.13%
Profitable Months	56.54%	58.44%	56.75%	57.59%	60.13%	63.92%

Notes: The zero yield column consists of firms that have a zero yield for the respective yield measure. Only non-zero yield firms are included in the quintile portfolios. Portfolios for each strategy are rebalanced each year on July 1 and are held from July 1 of year t until June 30 of year t+1. The time period under analysis is from July 1, 1972, to December 31, 2011. Financial firms are excluded. All returns are calculated as value-weight buy-and-hold. Quintile 5 represents the firms that are in the top quintile for yield. Quintile 1 represents the firms that are in the bottom quintile for yield.

on the effectiveness of dividend yield in Exhibit 4. When we analyze the Boudoukh et al. time period (1972–2003), we confirm that a high dividend yield investment strategy does not provide three-factor alpha. However, in an out-of-sample period from 2004 to 2011, the dividend yield metric handily outperforms all other metrics: the high-yield DIV quintile portfolio has a three-factor alpha of 52.1 bps a month, which is nearly double the estimate for the next highest alpha estimate produced by the high-yield SHYD portfolio (28.4 bps a month). However, even with the inclusion of the recent 2004 to 2011 period, the full sample period three-factor alpha estimate for dividend yield is still a statistically insignificant 16.5 bps a month.

Although the DIV strategy has outperformed recently, we find that this performance is highly contingent upon the exclusion of financials. The sample including financial firms has an insignificant –0.5 bps over the 2004 to 2011 period. The full sample results for DIV when financials are included are equally bad, yielding an insignificant –2.1 bps a month. PAY2 and SHYD performance are also contingent on the inclusion

Exhibit 4

Robustness: Top Quintile Results

	1972–1991	1992–2011	1972–2003	2004–2011	1972–1981	1982–1991	1992–2001	2002–2011	2002–2011 (with Financials)	1972–2011	1972–2011 (with Financials)
Panel A: DIV											
Average returns	1.318	1.050	1.238	0.963	1.013	1.608	1.187	0.913	0.513	1.182	1.098
Standard dev.	3.971	4.069	3.966	4.236	4.251	3.680	3.576	4.520	5.759	4.019	4.393
CAPM alpha	**0.418**	**0.494**	**0.438**	**0.532**	0.349	**0.490**	**0.618**	**0.497**	0.033	**0.453**	**0.328**
	0.005	0.014	0.003	0.010	0.155	0.005	0.049	0.015	0.904	0.000	0.010
Fama-French alpha	0.061	0.262	–0.003	**0.556**	–0.131	0.189	0.001	**0.521**	–0.005	0.165	–0.021
	0.578	0.090	0.978	0.005	0.453	0.113	0.997	0.007	0.981	0.085	0.815
Panel B: PAY1											
Average returns	1.362	1.049	1.333	0.695	1.089	1.621	1.348	0.750	0.560	1.203	1.163
Standard dev.	4.239	4.146	4.082	4.582	4.461	4.018	3.594	4.630	5.402	4.191	4.454
CAPM alpha	**0.425**	**0.406**	**0.472**	0.218	0.423	**0.414**	**0.593**	**0.304**	0.070	**0.416**	**0.353**
	0.002	0.006	0.000	0.105	0.073	0.003	0.018	0.019	0.674	0.000	0.001
Fama-French alpha	0.080	0.233	0.094	0.223	–0.071	0.143	0.068	**0.300**	0.023	**0.171**	0.052
	0.397	0.054	0.271	0.100	0.656	0.100	0.722	0.022	0.865	0.027	0.453
Panel C: PAY2											
Average returns	1.429	0.942	1.327	0.615	1.235	1.614	1.243	0.642	0.515	1.183	1.188
Standard dev.	4.469	3.804	4.147	4.127	4.733	4.215	3.253	4.278	4.669	4.148	4.324
CAPM alpha	**0.455**	**0.315**	**0.435**	0.165	**0.565**	**0.357**	**0.483**	**0.215**	0.063	**0.379**	0.368
	0.000	0.009	0.000	0.084	0.002	0.001	0.017	0.042	0.572	0.000	0.000
Fama-French alpha	**0.190**	**0.214**	**0.146**	0.179	0.180	**0.165**	0.128	**0.254**	0.079	**0.206**	**0.150**
	0.011	0.022	0.040	0.055	0.143	0.018	0.375	0.015	0.419	0.001	0.008
Panel D: SHYD											
Average returns	1.543	1.071	1.441	0.765	1.376	1.701	1.351	0.791	0.635	1.304	1.292
Standard dev.	4.997	4.192	4.605	4.604	5.504	4.480	3.523	4.767	4.974	4.608	4.725
CAPM alpha	**0.526**	**0.407**	**0.506**	**0.284**	**0.702**	**0.407**	**0.553**	**0.337**	0.168	**0.459**	**0.435**
	0.000	0.002	0.000	0.018	0.000	0.001	0.011	0.013	0.217	0.000	0.000
Fama-French alpha	**0.320**	**0.221**	**0.173**	**0.280**	**0.411**	**0.226**	0.053	**0.284**	0.107	**0.253**	**0.198**
	0.001	0.031	0.034	0.020	0.009	0.023	0.726	0.029	0.373	0.001	0.003

Notes: This Exhibit includes only the highest-yielding quintiles for each of the yield measures. We calculate monthly returns to the portfolios and run regressions against linear factor models. Portfolios for each strategy are rebalanced each year on July 1 and are held from July 1 of year t until June 30 of year t+1. All returns are calculated as value-weight buy-and-hold. The independent variables are the monthly excess value-weight market index returns and returns from the Fama and French factors [1993]. Alphas are in monthly percent, p-values are shown below the coefficient estimates, and 5% statistical significance is indicated in bold.

of financials; however, in contrast to DIV and PAY1, the more robust yield measures still have positive and statistically significant three-factor alpha estimates when one includes financials in the analysis. SHYD has the highest three-factor alpha and highest average returns with and without financials included in the analysis.

Last, we break the time series into four decades to assess robustness over time. There is no evidence that high DIV strategies systematically outperform. Three-factor alphas are statistically insignificant over most subsamples, and point estimates vary wildly. For example, over the 1972–1981 period, the alpha estimate is –13.1 bps, whereas over the 2002–2011 period, the estimate is 52.1 bps. The evidence suggests that SHYD is the most robust yield-based investment strategy. The SHYD strategy shows strong performance on average returns, one-factor, and three-factor alpha across the majority of subsamples and is robust to the inclusion of financials. Moreover, three-factor alphas for SHYD are statistically significant from zero in all samples, save the 1992–2001 period, which is a poor period for all high-yield metrics.

CONCLUSION

We study four yield measures: dividend yield (DIV), dividend plus repurchase yield (PAY1), dividend plus net repurchase yield (PAY2), and shareholder yield (SHYD). We confirm with newer data what previous research has found, namely, that dividend yield is a poor investment metric. We also highlight that high-dividend yield returns are susceptible to the inclusion or exclusion of financials. We add to the literature by identifying net-debt paydown as a way to create a more inclusive shareholder yield metric that enhances the returns to yield-based investment strategies. Our comparative analysis of yield-based investment strategies concludes that a yield metric that includes dividends, net repurchases, and net-debt paydown earns the highest historical compound annual growth rate and provides the highest three-factor alpha estimates.

ENDNOTE

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