
Assessing Alternative Quality Metrics

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KEY TAKEAWAYS

- ▶ The relation between profitability and expected returns is supported by valuation theory and empirical evidence.
- ▶ Alternative quality metrics don't contain incremental information about expected returns beyond what's in operating profitability.
- ▶ We find operating profitability to be more effective than alternative metrics at capturing the profitability premium.

Introduction

Quality factor investing has grown in popularity in the last decade partially due to the seminal paper by Robert Novy-Marx (2013) on profitability and the inclusion of the profitability factor in the five-factor Fama/French model (2015). While there is no consensus on the definition of quality, a common practice in the financial industry is to form a composite quality score that incorporates the following broad concepts: profitability, leverage, earnings variability, and net payout. Specifically, high-quality stocks are often defined as stocks with high profitability, low leverage, low earnings variability, and high net payout. Do investors really need a blend of all these variables to pursue the profitability premium effectively? We provide an answer below.

Assessing Efficacy of Quality Metrics

Valuation theory says that the expected return on an investment is driven by its price today and its expected future cash flows. Holding the current price fixed, the higher the expected future cash flows of a company, the higher its expected return. Therefore, expected future profitability should be positively related to expected returns. This is the theoretical motivation behind the profitability premium.

Measures of current profitability, such as operating profits scaled by book equity (“operating profitability”) and net income scaled by book equity (“return on equity” or “ROE”), are reliable proxies for expected future profitability (O’Reilly and Rizova 2013). Therefore, they should generate reliable spreads in average stock returns. The other popular quality metrics (leverage, earnings variability, and net payout) are not directly related to expected returns under the valuation theory. However, they might still generate spreads in average stock returns if they contain information about expected future cash flows or are correlated with current valuation ratios.

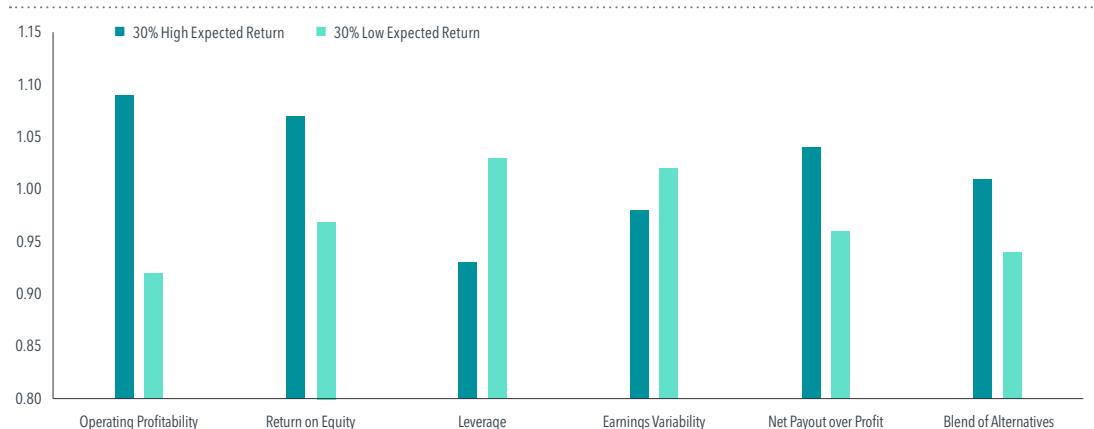
To explore this possibility, we examine portfolios of US stocks sorted on each of those metrics. **Exhibit 1** provides the definitions of the quality metrics we use. Due to requiring five years of history, the coverage of the earnings variability, net payout, and blend of alternatives is approximately half of the market capitalization.

EXHIBIT 1: Definitions of Quality Metrics

Metric	Definition
Operating Profitability	Operating income before depreciation and amortization minus interest expense scaled by book equity.
Return on Equity (ROE)	Income before extraordinary items scaled by book equity.
Leverage	Total debt scaled by book equity. Total debt is the sum of long-term and short-term debt.
Earnings Variability	The standard deviation of year-over-year growth in earnings per share, excluding extraordinary items, over the past five fiscal years.
Net Payout over Profits	The sum of total net payout over the past five fiscal years scaled by gross profits over the past five fiscal years. Net payout is income before extraordinary items minus changes in book equity. Gross profits are revenue minus cost of goods sold.

For each quality metric, we form two hypothetical portfolios targeting the highest and lowest 30% of the US market capitalization sorted on the metric. The high expected return portfolios refer to stocks with high relative operating profitability, high ROE, low leverage, low earnings volatility, and high net payout. The low expected return portfolios refer to stocks at the opposite end of the spectrums.

EXHIBIT 2: Average Monthly Return (%) for Hypothetical Portfolios Formed on Quality Metrics, July 1, 1974–December 31, 2022



Returns in USD. Past performance, including hypothetical performance, is no guarantee of future results. Actual investment returns may be lower. Filters were applied to data retroactively and with the benefit of hindsight. Groups of stocks and their returns are hypothetical, are not representative of indices, actual investments, or actual strategies managed by Dimensional, and do not reflect costs and fees associated with an actual investment. See Additional Information in Appendix.

Exhibit 2 reports the results. The hypothetical quality portfolios formed on operating profitability generate the largest spread in average monthly returns (17 basis points per month), followed by 10 bps for ROE and 7 bps for net payout over profits. The stronger results for operating profitability over ROE are not surprising because operating profitability not only captures major costs and expenses of businesses across sectors but also focuses on recurring items (Fama and French 2015; Novy-Marx 2013; O'Reilly and Rizova 2013). On the other hand, bottom-line accounting measures such as net income, used in ROE, are more susceptible to one-off charges and less related to persistent economic profitability.

Not all portfolios formed on quality metrics show positive return spreads. The high-leverage portfolio and the high-earnings volatility portfolio outperform their counterparts by 10 bps and 5 bps per month, respectively. The inconsistent sign of spreads in univariate portfolios formed on nonprofitability quality metrics underscores the importance of a theoretical framework in identifying the drivers of expected returns.

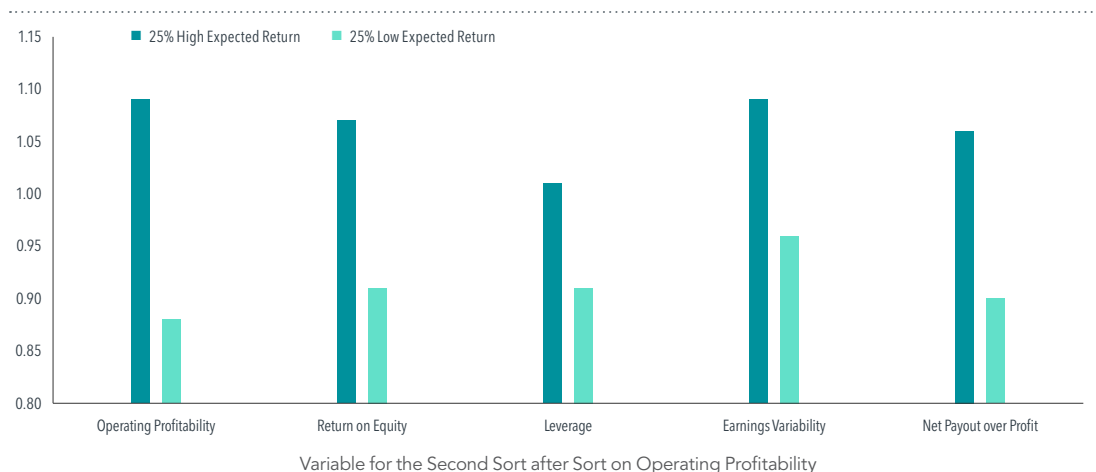
While some quality metrics fail to provide information about expected returns in isolation, they may work better in combination. Therefore, in Exhibit 2 we report the performance of two hypothetical portfolios based on a blend of the alternative metrics. We rank each firm

based on ROE, leverage, earnings variability, and net payout and take the average of these four ranks. While the average return spread is positive, it is still meaningfully smaller than the spread generated by operating profitability (7 vs. 17 bps per month).

It is also possible that some quality metrics contain incremental information after accounting for operating profitability. To consider this possibility, we form double-sorted portfolios on operating profitability and one more quality metric. Specifically, we first sort eligible firms into high- and low-operating-profitability groups, each representing half of the market capitalization, and then partition firms in each operating-profitability group into the top and bottom 50% of the market capitalization based on an additional quality metric. The double-sorted portfolios result in four portfolios, each representing 25% of the market capitalization. Thus, for each variable pair, we have a high-high portfolio of stocks that is considered to have a higher expected return based on both the first and second sorts (e.g., high profitability and low leverage). The low-low portfolios are constructed similarly (i.e., low profitability and high leverage).¹

We examine the return spread between the high-high and low-low portfolios in **Exhibit 3**. All return spreads become positive, but operating profitability dominates again. The double sort using operating profitability as the second sorting variable yields the largest difference in average returns (21 bps per month).² This implies that the other quality metrics do not have incremental information about expected returns beyond the information contained in operating profitability.

EXHIBIT 3: Average Monthly Return (%) for Hypothetical Portfolios Formed on Operating Profitability and Other Quality Metrics, July 1, 1974–December 31, 2022



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1. The double-sorted portfolios whose first and secondary sort are both on operating profitability represent a granular cut on operating profitability and serve as a benchmark for alternative double-sorted portfolios.
 2. The findings are similar within large and small cap markets as shown in Exhibits A1 and A2 in the Appendix.

To gain insights into the weak empirical relation between the alternative quality metrics and expected returns, we examine the forecasting power of those metrics for future profitability.

Panel A of Exhibit 4 reports the results of Fama-MacBeth annual regressions of operating profitability one, three, and five years into the future on current operating profitability and other quality metrics (controlling for market capitalization, book-to-market equity, growth in assets, and momentum). To put the different variables on equal footing and mitigate the impact of outliers, we transform all variables into decile rankings. This allows us to interpret each coefficient as the change in the future profitability ranking if the current profitability/quality ranking changes by one decile.

Adding other quality metrics in the regressions that already use operating profitability barely changes the adjusted R^2 .³ Moreover, the coefficients on operating profitability do not materially change, while those on the other metrics are either unexpectedly negative (ROE), unexpectedly positive (leverage), or much smaller. These results suggest that none of the additional quality metrics materially improves the forecasting power of current operating profitability for future operating profitability.

Panel B repeats the analysis while defining future profitability as future ROE. Again, we observe negligible changes in R^2 across all specifications. Operating profitability is a strong predictor of future ROE, and it becomes a stronger predictor than current ROE for five years into the future.

Overall, we find no compelling evidence that the alternative metrics contain additional forecasting power for future profitability. It is no surprise, then, that they do not appear to contain additional forecasting power for future returns either.

3. R^2 measures how much of variance in the dependent variable can be explained by the independent variables. This can be adjusted for the number of independent variables used in the regression.

EXHIBIT 4: Forecasting Power for Future Profitability, 1974-2022

Panel A: Predicting Future Operating Profitability

Dependent Variable = Operating Profitability (t+1)						
Intercept	4.6*** (15.6)	1.3*** (10.1)	1.4*** (9.4)	1.1*** (7.4)	1.6*** (11.4)	1.4*** (12.2)
Size	0.6*** (8.4)	0.2*** (7.6)	0.2*** (7.9)	0.1*** (6.6)	0.1*** (6.4)	0.1*** (7.4)
Value	-0.1*** (-4.9)	0.0*** (-4.7)	0.0*** (-4.5)	0.0*** (-6.4)	0.0*** (-6.3)	-0.1*** (-8.2)
Investment	0.1*** (5.8)	0.0*** (-4.8)	0.0*** (-4.0)	0.0*** (-7.2)	0.0*** (-4.9)	0.0*** (-4.2)
Momentum	0.4*** (5.5)	0.1** (2.4)	0.1*** (3.0)	0.1*** (2.8)	0.1** (2.5)	0.1** (2.1)
Operating Profitability		0.7*** (53.1)	0.8*** (80.1)	0.7*** (62.4)	0.7*** (54.4)	0.7*** (50.9)
Quality			-0.1*** (-4.8)	0.1*** (5.6)	0.0*** (-2.6)	0.0*** (3.5)
Definition of Quality:			ROE	Leverage	Earnings Variability	Net Payout over Profits
Average Adjusted R ²	17.9%	60.7%	61.0%	61.7%	60.8%	59.8%

Dependent Variable = Operating Profitability (t+3)						
Intercept	4.6*** (15.3)	2.1*** (9.3)	2.2*** (8.5)	1.8*** (7.7)	2.4*** (9.7)	2.2*** (10.4)
Size	0.6*** (8.1)	0.3*** (7.6)	0.3*** (8.2)	0.2*** (7.3)	0.2*** (5.9)	0.2*** (6.9)
Value	-0.1*** (-4.4)	0.0 (-1.2)	0.0 (-1.6)	0.0*** (-2.8)	0.0** (-2.1)	0.0*** (-3.2)
Investment	0.0*** (3.1)	-0.1*** (-11.3)	0.0*** (-7.0)	-0.1*** (-12.4)	-0.1*** (-12.6)	0.0*** (-10.0)
Momentum	0.1 (1.1)	-0.2*** (-3.6)	-0.1*** (-3.1)	-0.2*** (-3.4)	-0.2*** (-3.8)	-0.2*** (-4.0)
Operating Profitability		0.6*** (25.9)	0.6*** (53.9)	0.5*** (29.9)	0.6*** (27.0)	0.5*** (29.1)
Quality			-0.1*** (-5.8)	0.1*** (7.8)	0.0*** (-2.8)	0.0*** (6.6)
Definition of Quality:			ROE	Leverage	Earnings Variability	Net Payout over Profits
Average Adjusted R ²	12.8%	36.9%	37.6%	38.1%	37.1%	36.3%

Dependent Variable = Operating Profitability (t+5)						
Intercept	4.4*** (17.9)	2.1*** (10.6)	2.3*** (10.3)	1.9*** (8.3)	2.5*** (9.8)	2.2*** (12.3)
Size	0.6*** (8.6)	0.4*** (9.4)	0.4*** (9.8)	0.3*** (9.4)	0.3*** (7.1)	0.3*** (8.9)
Value	-0.1*** (-3.2)	0.0 (1.0)	0.0 (0.4)	0.0 (-0.4)	0.0 (0.2)	0.0 (-0.8)
Investment	0.0*** (3.4)	-0.1*** (-7.9)	0.0*** (-5.2)	-0.1*** (-8.4)	-0.1*** (-9.5)	0.0*** (-7.9)
Momentum	0.0 (-0.0)	-0.2*** (-3.4)	-0.2*** (-2.8)	-0.2*** (-3.2)	-0.2*** (-3.6)	-0.3*** (-4.3)
Operating Profitability		0.5*** (23.4)	0.6*** (31.4)	0.5*** (26.7)	0.5*** (25.0)	0.5*** (28.8)
Quality			-0.1*** (-8.9)	0.1*** (6.7)	0.0** (-2.2)	0.0*** (5.6)
Definition of Quality:			ROE	Leverage	Earnings Variability	Net Payout over Profits
Average Adjusted R ²	11.5%	28.5%	29.2%	29.7%	28.7%	28.0%

Panel B: Predicting Future ROE

Dependent Variable = ROE (t+1)						
Intercept	4.7*** (19.1)	2.5*** (21.1)	2.1*** (16.8)	2.2*** (16.5)	3.2*** (24.6)	2.7*** (22.7)
Size	0.6*** (9.9)	0.2*** (8.7)	0.2*** (9.2)	0.2*** (7.3)	0.2*** (7.0)	0.2*** (7.4)
Value	-0.2*** (-6.3)	-0.1*** (-11.8)	-0.1*** (-10.6)	-0.1*** (-12.8)	-0.1*** (-14.5)	-0.1*** (-17.3)
Investment	0.1*** (8.2)	0.0*** (-5.6)	0.0*** (-5.5)	0.0*** (-7.3)	0.0*** (-5.8)	0.0*** (-2.8)
Momentum	0.6*** (7.3)	0.2*** (4.6)	0.2*** (4.9)	0.2*** (5.0)	0.2*** (4.9)	0.2*** (4.9)
ROE		0.6*** (46.5)	0.4*** (23.0)	0.6*** (51.7)	0.6*** (40.2)	0.5*** (34.4)
Quality			0.2*** (14.1)	0.1*** (4.5)	0.0*** (-6.3)	0.1*** (6.3)
Definition of Quality:			Operating Profitability	Leverage	Earnings Variability	Net Payout over Profits
Average Adjusted R ²	19.7%	43.7%	46.2%	44.7%	43.8%	43.4%

Dependent Variable = ROE (t+3)						
Intercept	5.1*** (19.9)	3.7*** (17.4)	3.3*** (14.6)	3.4*** (14.0)	4.5*** (18.5)	3.9*** (17.4)
Size	0.5*** (8.6)	0.3*** (7.6)	0.3*** (7.6)	0.3*** (7.5)	0.2*** (5.5)	0.2*** (5.9)
Value	-0.1*** (-5.9)	-0.1*** (-5.1)	-0.1*** (-4.4)	-0.1*** (-6.4)	-0.1*** (-6.7)	-0.1*** (-7.9)
Investment	0.0*** (3.2)	-0.1*** (-7.9)	-0.1*** (-8.2)	-0.1*** (-9.0)	-0.1*** (-9.0)	0.0*** (-4.4)
Momentum	0.1** (2.2)	-0.1*** (-2.7)	-0.1** (-2.3)	-0.1** (-2.6)	-0.1** (-2.4)	-0.1*** (-2.7)
ROE		0.4*** (19.1)	0.2*** (14.6)	0.4*** (21.3)	0.3*** (17.9)	0.3*** (19.2)
Quality			0.2*** (13.1)	0.1*** (5.8)	-0.1*** (-5.8)	0.1*** (11.1)
Definition of Quality:			Operating Profitability	Leverage	Earnings Variability	Net Payout over Profits
Average Adjusted R ²	10.3%	19.5%	21.5%	20.3%	19.9%	20.0%

Dependent Variable = ROE (t+5)						
Intercept	4.8*** (25.9)	3.7*** (23.0)	3.4*** (18.8)	3.5*** (17.9)	4.5*** (24.5)	3.8*** (27.3)
Size	0.5*** (9.2)	0.3*** (9.4)	0.3*** (10.3)	0.3*** (9.5)	0.3*** (6.7)	0.3*** (8.2)
Value	-0.1*** (-4.4)	0.0*** (-2.8)	0.0** (-2.1)	-0.1*** (-3.8)	-0.1*** (-4.7)	-0.1*** (-6.5)
Investment	0.0* (1.7)	-0.1*** (-6.4)	-0.1*** (-6.2)	-0.1*** (-6.9)	-0.1*** (-7.4)	0.0*** (-3.6)
Momentum	0.0 (0.5)	-0.1** (-2.1)	-0.1* (-1.9)	-0.1** (-2.0)	-0.1 (-1.6)	-0.2** (-2.5)
ROE		0.3*** (17.0)	0.1*** (9.6)	0.3*** (18.3)	0.2*** (16.4)	0.2*** (14.9)
Quality			0.2*** (11.2)	0.1*** (5.2)	-0.1*** (-6.2)	0.1*** (9.3)
Definition of Quality:			Operating Profitability	Leverage	Earnings Variability	Net Payout over Profits
Average Adjusted R ²	8.2%	13.3%	14.6%	14.0%	13.7%	14.1%

The Fama-MacBeth estimates of regression coefficients, t-statistics, and R² are based on annual cross-sectional regressions of future operating profitability (ROE) on current market capitalization, book-to-market, operating profitability (ROE), asset growth, price momentum, and various quality metrics. Both dependent and independent variables are transformed to % market capitalization deciles, except for market capitalization, which is transformed into five groups. Higher underlying values correspond to higher ranks. Regressions are performed as of each fiscal year, and the standard errors are Newey-West-adjusted for three lags. See Additional Information in Appendix.

Conclusion

Both valuation theory and empirical evidence support operating profitability as a driver of expected stock returns. The lack of strong theoretical and empirical support for the alternative quality metrics casts doubt on their effectiveness in the pursuit of higher expected returns. Relying on a composite quality score could dilute the information in operating profitability and lead to an inefficient path to capturing the profitability premium. In other words, quality provides yet another example where less is more when it comes to investing.

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APPENDIX

Additional Information

Source: Dimensional, using CRSP and Compustat data. The eligible universe includes US firms of all market capitalization, excluding REITs, utilities, tracking stocks, and investment companies. The portfolios are rebalanced semiannually at the end of each June and December. The US market includes eligible firms of all market capitalizations at their market cap.

The hypothetical performance data is “net performance,” which includes the reinvestment of dividends and other earnings and reflects the deduction of an investment advisory fee of 33 basis points for each year. To account for trading costs the simulated performance does reflect the deduction of an assumed brokerage fee of 1.5 basis points for each year using an estimated turnover number.

Performance in US Large and Small Cap Markets

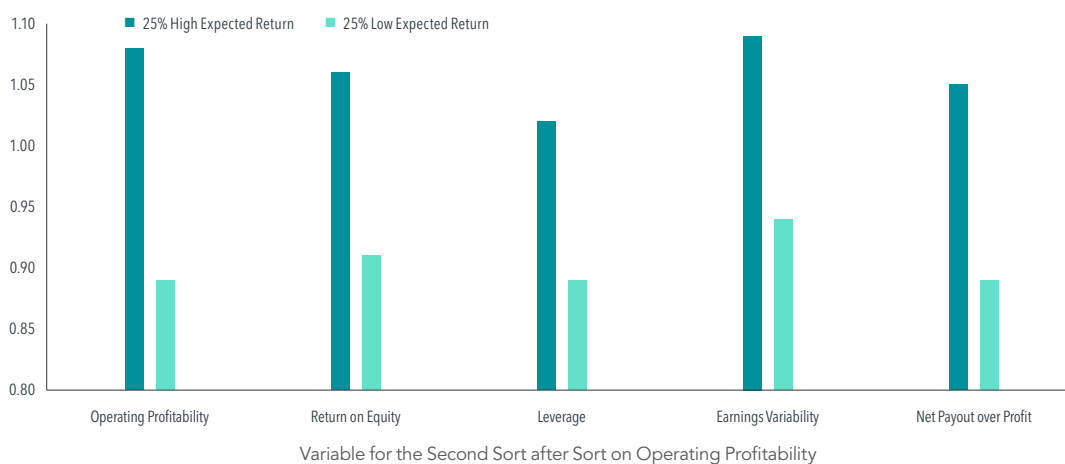
EXHIBIT A1: Average Monthly Return (%) in Large Cap Market, July 1, 1974–December 31, 2022

Panel A: Single-Sorted Portfolios Formed on Quality Metrics



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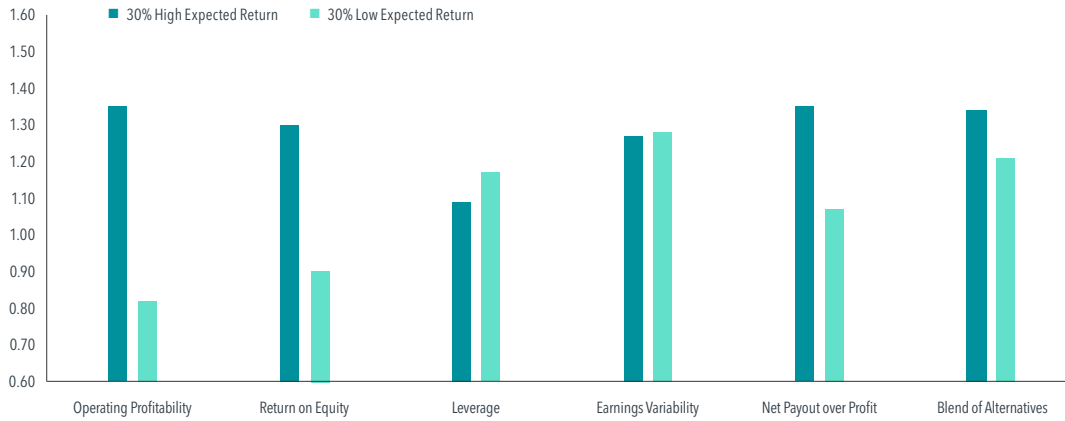
Panel B: Double-Sorted Portfolios Formed on Operating Profitability and Quality Metrics



Returns in USD. Past performance, including hypothetical performance, is no guarantee of future results. Actual investment returns may be lower. Filters were applied to data retroactively and with the benefit of hindsight. Groups of stocks and their returns are hypothetical, are not representative of indices, actual investments, or actual strategies managed by Dimensional, and do not reflect costs and fees associated with an actual investment.

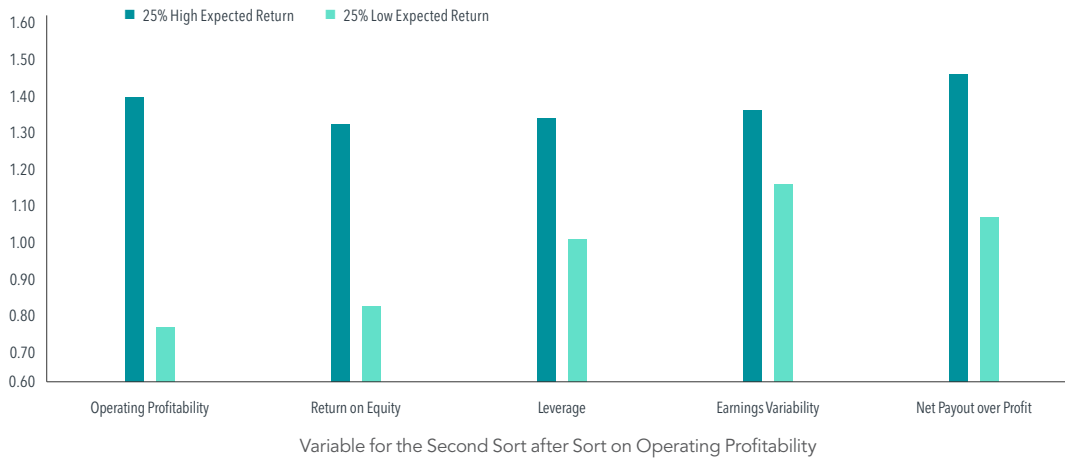
EXHIBIT A2: Average Monthly Return (%) in Small Cap Market, July 1, 1974–December 31, 2022

Panel A: Single-Sorted Portfolios Formed on Quality Metrics



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Panel B: Double-Sorted Portfolios Formed on Operating Profitability and Quality Metrics



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