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Free Cash Flow Factor: Exploring Strong and Sustainable Profitability

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Research Highlights:

- Free Cash Flow is a superior current profitability indicator compared to earnings when it comes to quality investing.
- Studies demonstrate that the quality of a company's earnings is heavily influenced by its use of accounting accruals. A non-linear correlation exists between a company's use of accruals and its stock price performance after controlling for profitability.
- The FCF Advisors Free Cash Flow Factor combines free cash flow with accruals to identify stocks of companies across global markets capable of generating both strong and sustainable profitability, and thus most likely to consistently deliver excess returns.

Introduction

All too often, when it comes to long-term stock investing, an investor's perception of the intrinsic value compared to the current stock price drives decision making. Many efforts have been made in the financial industry to estimate the present value of a stock in the hopes of capturing future appreciation. The Dividend Discount and Discounted Cash Flow Models are among the most popular with fundamental analysts for equity valuation. Despite their popularity, most of these valuation models are subject to huge estimation errors given the use of projected cash flows or dividends and a regression-based growth rate. Besides, many model inputs, such as the cost of debt and cost of equity, require in-depth research on the company, and their calculation standards vary from company to company – even within the same market segment. To build a scalable stock selection model and investment process, a portfolio manager needs to leverage reliable financial statement information to evaluate stocks uniformly across global markets based on forward-looking insights.

In this research paper, we examine how the FCF Advisors Free Cash Flow factor better identifies high-quality companies with both backward-looking strong profitability and forward-looking sustainable profitability measures expected to persist into the future. Our empirical analysis shows that using this Free Cash Flow Factor as an alpha factor can potentially generate consistent excess returns on both an absolute and risk-adjusted basis globally.

The empirical research is organized into three sections. First, we show the superior predictive power of free cash flow-based indicators compared to earnings by analyzing quintile portfolio performance constructed using these two metrics. Second, we revisit the accrual anomaly documented in the academic literature on both its predictability of future profits and stock return; and how applying the company's free cash flow condition as a filter can improve the predictive power of accruals to cross-section stock returns. Finally, we present the Free Cash Flow factor, to demonstrate how a combination of free cash flow and accruals can potentially generate consistent excess return across global equity markets.

Data Source

We conducted our empirical analysis utilizing a global equity universe from 08/31/2000 to 08/31/2019, applying the following rules:

- U.S. universe: stocks in the Russell 3000 Index and Russell Microcap Index
- Global ex-U.S. universe: stocks that consist of 98% of the cumulative market capitalization of international stocks, excluding China A-Shares
- Only companies that have reported the latest fiscal year total assets are included
- Financial companies are excluded due to inconsistencies in free cash flow calculation standards

All data are provided by FactSet on a trailing-twelve-month basis. Country/Region Classification is based on FactSet fundamental FF_COUNTRY data, representing the location of primary corporate offices of a company. The market and region classifications are based on MSCI and the World Bank's documentation. For calculation convenience, the analysis assumes a risk-free rate of zero.



Strong Profitability: The Predictive Power of Free Cash Flow-Based Investment Indicators

The Quality Factor is widely considered one of the most consistent alpha generators among investment strategies throughout the business cycle. When identifying high-quality companies, profitability is a primary characteristic. While earnings-based investment indicators have long been used to measure profitability, we have found that accounting metrics, such as GAAP earnings are subject to management manipulation. Our empirical analysis shows that free cash flow-based investment indicators are superior in almost every category.

We constructed quintile portfolios based on the ranking of two sets of indicators: free cash flow-based and earnings-based (net income), as shown in Table 1.1. We used both equal-weighted and cap-weighted portfolio construction approaches to compare portfolio performance. These portfolios are rebalanced monthly.

Table 1.1 Free Cash Flow and Earning Based Investment Metrics Definitions

Free Cash Flow-based (FCF)	Earning-based (Net Income, NI)
Free Cash Flow to Total Assets (FCFOA)	Earnings to Total Assets (NIOA)
Free Cash Flow to Total Debts (FCFOD)	Earnings to Total Debts (NIOD)
Free Cash Flow to Total Equity (FCFOE)	Earnings to Total Equity (NIOE)

Empirical Result

Backtested quintile portfolio performance results can be found in Tables 1.2 and 1.3. As demonstrated, free cash flow-based measures outperform earning-based measures in all comparisons for both absolute and risk-adjusted returns.

Equal-weighted Portfolio Performance

As shown in Table 1.2, an average of the three top quintile portfolios using earnings-based measures outperform the benchmark by 2.83% (10.55% - 7.72%). However, an average of the three top Free cash flow-based quintile portfolios outperform the benchmark by 6.17% (13.89% - 7.72%), with a 0.23 (0.83 – 0.60) Sharpe ratio improvement.

Table 1.2 Global Equal-Weighted Quintile Portfolio Performance, 08/31/2000 to 08/31/2019
Free Cash Flow (FCF) Versus Earnings (Net Income, NI)

Indicator	Performance Measures	5 (Highest)	4	3	2	1 (Lowest)
FCFOA	Annual Return	14.55%	12.10%	9.19%	5.19%	-1.94%
	Annual Volatility	16.84%	16.32%	16.84%	18.58%	24.87%



	Sharpe Ratio	0.87	0.74	0.55	0.28	-0.08
FCFOE	Annual Return	14.63%	12.11%	8.69%	4.50%	-0.58%
	Annual Volatility	16.94%	16.26%	16.45%	18.62%	23.50%
	Sharpe Ratio	0.87	0.75	0.53	0.24	-0.02
FCFOD	Annual Return	12.49%	12.99%	10.26%	4.96%	-1.99%
	Annual Volatility	16.39%	16.31%	17.53%	19.16%	24.44%
	Sharpe Ratio	0.76	0.80	0.59	0.26	-0.08
NIOA	Annual Return	10.57%	10.20%	8.91%	6.79%	1.36%
	Annual Volatility	17.60%	16.89%	16.71%	16.95%	25.46%
	Sharpe Ratio	0.60	0.61	0.53	0.40	0.05
NIOE	Annual Return	11.72%	10.15%	8.37%	6.43%	1.50%
	Annual Volatility	17.98%	17.09%	16.49%	16.54%	24.03%
	Sharpe Ratio	0.65	0.60	0.51	0.39	0.06
NIOD	Annual Return	9.36%	10.15%	9.75%	7.28%	1.37%
	Annual Volatility	16.69%	16.94%	17.22%	17.67%	25.67%
	Sharpe Ratio	0.56	0.60	0.57	0.41	0.05
Benchmark	Annual Return	7.72%				
	Annual Volatility	18.42%				
	Sharpe Ratio	0.42				

Cap-weighted Portfolio Performance

In the cap-weighted portfolio performance table 1.3, averaging the free cash flow-based top quintile portfolios results in outperformance over the benchmark of 2.28% (7.74% - 5.46%) and outperforms the average earning-based top quintile portfolio by 1.06% (6.52% - 5.46%) with a 0.10 (0.54 – 0.44) Sharpe ratio improvement.

Table 1.3 Global Cap-Weighted Quintile Portfolio Performance, 08/31/2000 to 08/31/2019
Free Cash Flow (FCF) Versus Earnings (Net Income, NI)

Indicator	Performance Measures	5 (Highest)	4	3	2	1 (Lowest)
FCFOA	Annual Return	8.16%	7.66%	4.19%	2.07%	-2.67%
	Annual Volatility	14.21%	14.61%	16.11%	17.65%	22.45%



	Sharpe Ratio	0.58	0.53	0.26	0.12	-0.12
FCFOE	Annual Return	8.44%	7.02%	3.22%	1.69%	-0.58%
	Annual Volatility	14.41%	14.85%	15.87%	17.76%	21.03%
	Sharpe Ratio	0.59	0.47	0.20	0.10	-0.03
FCFOD	Annual Return	6.62%	8.56%	5.53%	1.92%	-2.43%
	Annual Volatility	14.54%	14.08%	15.84%	17.50%	22.78%
	Sharpe Ratio	0.46	0.61	0.35	0.11	-0.11
NIOA	Annual Return	6.63%	7.60%	4.64%	3.86%	-0.80%
	Annual Volatility	15.02%	14.78%	15.57%	16.42%	22.05%
	Sharpe Ratio	0.44	0.52	0.30	0.24	-0.04
NIOE	Annual Return	7.21%	6.42%	4.82%	3.25%	-0.50%
	Annual Volatility	14.70%	15.51%	15.55%	16.19%	21.21%
	Sharpe Ratio	0.49	0.42	0.31	0.20	-0.02
NIOD	Annual Return	5.72%	7.48%	6.19%	4.34%	-0.74%
	Annual Volatility	15.07%	14.82%	15.05%	16.28%	21.61%
	Sharpe Ratio	0.38	0.51	0.41	0.27	-0.03
Benchmark	Annual Return	5.46%				
	Annual Volatility	15.52%				
	Sharpe Ratio	0.35				

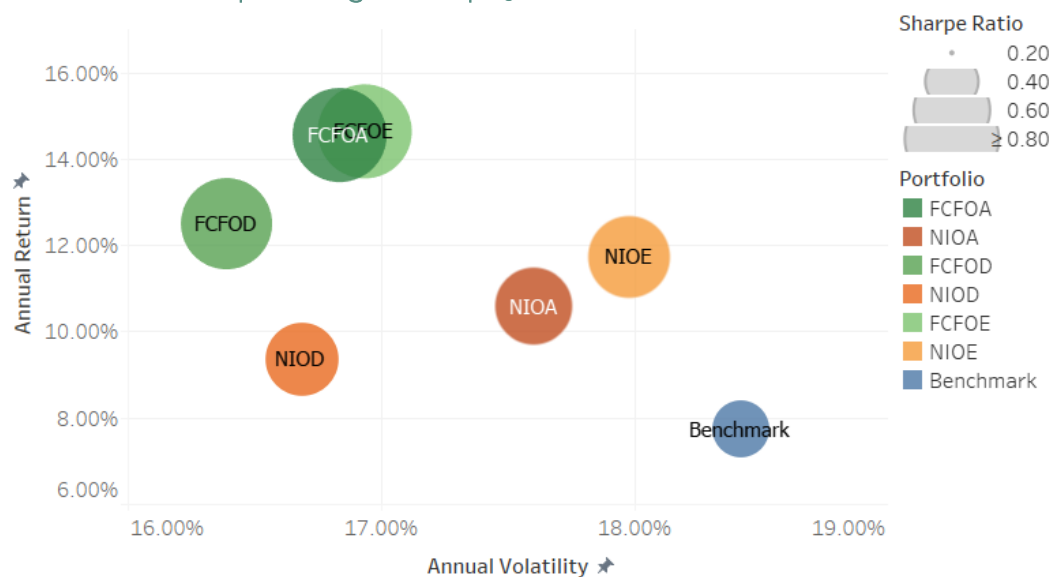
Sources: FCF Advisors, FactSet.

Top Quintile Portfolio Return and Risk Visualization

A more direct presentation of the results above is illustrated in chart 1.1 and chart 1.2 for equal-weighted and cap-weighted portfolios, respectively, where the X-axis represents the reverse annual volatility, and the Y-axis represents the portfolio annual return. The size of the circles depicts the magnitude of each portfolio's Sharpe ratio.



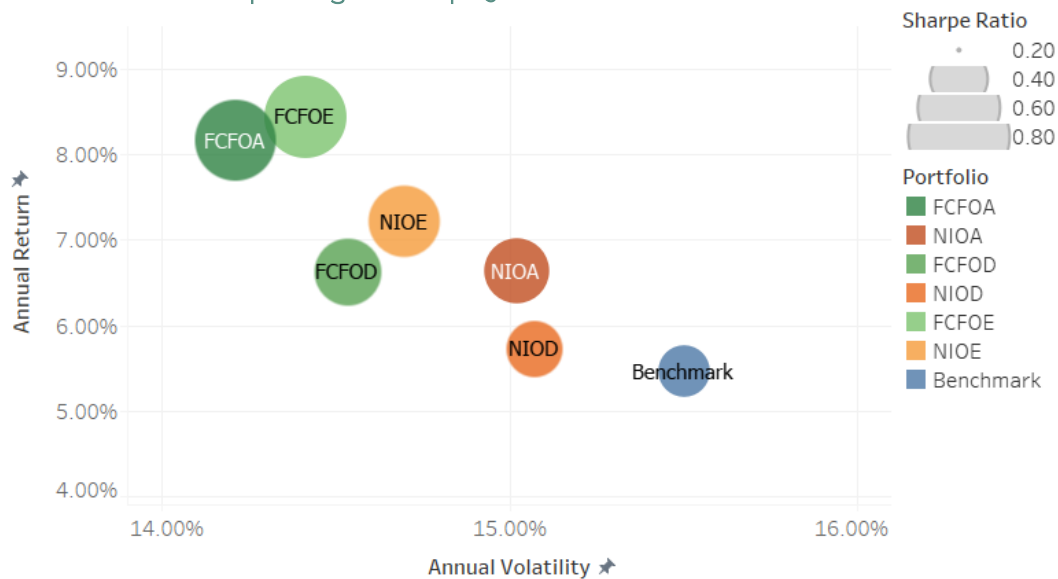
Chart 1.1 Global Equal-Weighted Top Quintile Portfolio Return and Risk Metrics



Notes: Top quintile portfolio return and risk are calculated from 08/31/2000 to 08/31/2019, rebalanced monthly on an equally weighted basis, based on the highest 20% ranking of different measures.

Sources: FCF Advisors, FactSet.

Chart 1.2 Global Cap-Weighted Top Quintile Portfolio Return and Risk Metrics



Notes: Top quintile portfolio return and risk are calculated from 08/31/2000 to 08/31/2019 on a monthly rebalance and market-cap-weighted basis based on the highest 20% ranking of different measures.

Sources: FCF Advisors, FactSet.



Sustainable Profitability: Revisiting the Accruals Anomaly

The Accrual Anomaly is the negative association between accounting accruals and subsequent stock returns. First discussed by Richard Sloan in 1996, this theory suggests that a company's earnings are comprised of either real cash flow or questionable accounting practices. Real cash flow is considered a more accurate measure of earnings, while accruals are subject to manipulation by a company's choice of accounting method. The research stipulates that firms with low levels of accruals relate to real earnings, while firms with a high level of accruals could be the result of the chosen accounting practice. As a result, stocks with low accruals should earn higher market returns than those with high accruals.

We revisit the accrual anomaly by forming global quintile portfolios and looking at the predictability of accrual on future earnings. We find that low-accrual companies do outperform average-accrual and high-accrual companies, but there is underlying risk involved. Our empirical results suggest that using current free cash flow as an identifier can mitigate the risk of low-accrual companies and further provide a measure of sustainable profitability.

Revisit Accrual Anomaly in a Quintile Portfolio Backtest

We defined accruals as $(\text{Operating Cash Flow} - \text{Net Income}) / \text{Total Assets}$, and construct quintile portfolios based on the stocks ranking in the universe. Table 2.1 and 2.2 shows the performance of the hypothetical portfolios. As can be noted, while the low-accrual portfolios demonstrate consistent outperformance, the overall risk is higher in the equal-weighted portfolio versus the cap-weighted portfolio due to the increased influence of higher volatility, small-cap companies.

Table 2.1 Global Equal-Weighted Quintile Portfolio Performance, 08/31/2000 to 08/31/2019
Accruals Quintile Group Performance

Indicator	Performance Measures	1 (Lowest)	2	3	4	5 (Highest)
Accruals	Annual Return	9.99%	10.05%	8.77%	7.06%	2.52%
	Annual Volatility	21.70%	17.06%	16.43%	17.26%	20.45%
	Sharpe Ratio	0.46	0.59	0.53	0.41	0.12
Benchmark	Annual Return	7.72%				
	Annual Volatility	18.42%				
	Sharpe Ratio	0.42				

Sources: FCF Advisors, FactSet.



Table 2.2 Global Cap-Weighted Quintile Portfolio Performance, 08/31/2000 to 08/31/2019
Accruals Quintile Group Performance

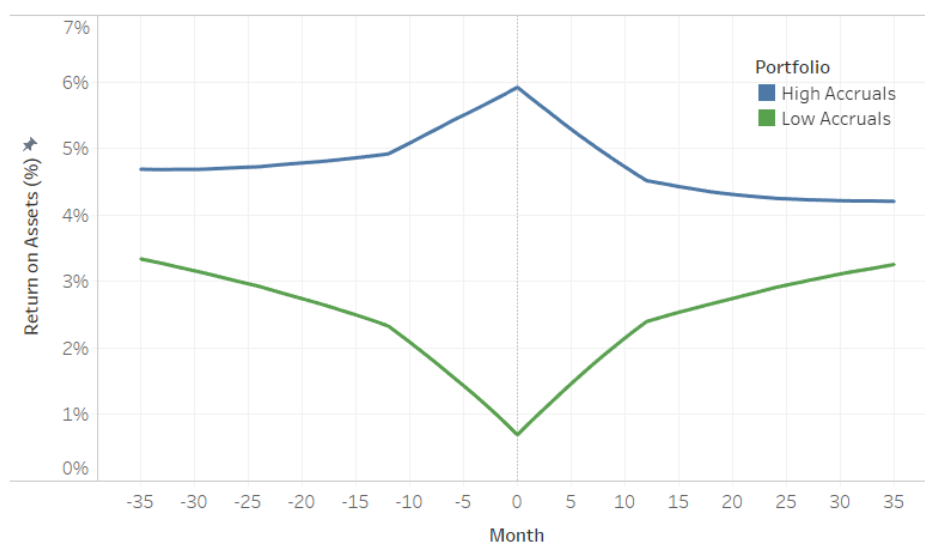
Indicator	Performance Measures	1 (Lowest)	2	3	4	5 (Highest)
Accruals	Annual Return	6.14%	6.78%	5.76%	4.72%	1.83%
	Annual Volatility	18.55%	14.56%	14.53%	15.38%	18.75%
	Sharpe Ratio	0.33	0.47	0.40	0.31	0.10
Benchmark	Annual Return	5.46%				
	Annual Volatility	15.52%				
	Sharpe Ratio	0.35				

Sources: FCF Advisors, FactSet.

The Predictive Power of Accruals in Future Profitability

We also look at the future profitability trend of the high and low accruals groups and find that high-accrual group experience rising profitability about 12 months before group formation while their profitability declines about 10 months after the formation. In contrast, the low accruals groups exhibit declining profitability in the 36 months preceding group formation and rising profitability in the 36 months post group formation, as shown in Chart 2.1. Our empirical evidence shows that the accruals component in earnings does predict the future profitability of a company. And companies with lower accruals demonstrate a growing future profit growth and are, in general, rewarded by the equity market.

Chart 2.1 Return on Assets Trend of High/Low Accruals Companies



Notes: The return on assets (ROA) formation is calculated by taking the average ROA of high/low accruals companies in the global equity universe, from 08/31/2003 to 08/31/2016, the cutoff point for the high/low accruals group is 50%.

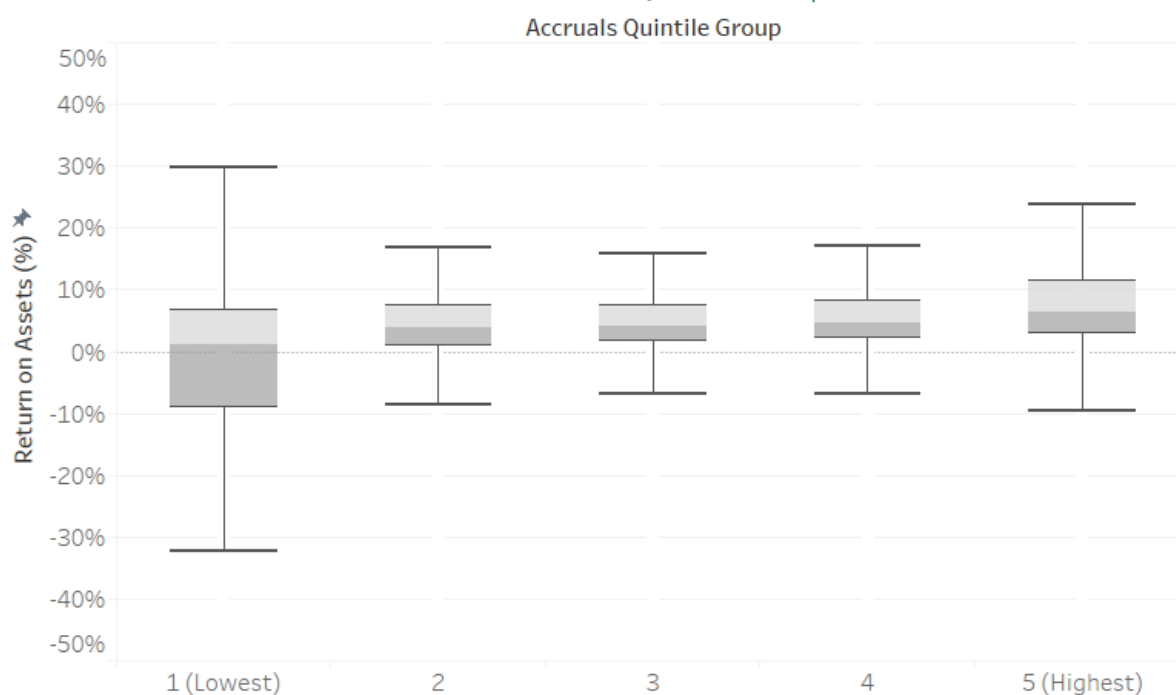
Sources: FCF Advisors, FactSet.



Risks Associated with Companies of Lowest Accruals

Now that we have established the effectiveness of using accruals to identify sustainable profitability and alpha generation, we need to address the underlying risk of the lowest accruals group. While low accruals may represent a larger portion of real cash flow, it may also indicate an overall lack of profitability. Chart 2.2 shows the distribution of Return on Assets (ROA) by different accruals groups. We find that significant tail risk exists in the lowest accrual group distribution (also in the highest accrual group) since there are many unprofitable companies in that group. The chart shows that although companies with lower accruals may have larger current operating cash flow than earnings, the lower accrual group has generally weak current earnings. In the first section, we find that although net income is not as good as free cash flow in predicting cross-section of stock return, companies with weak ROA did underperform by a lot. So it would be important for different companies in the lowest accrual group by measuring their current profitability to isolate those low accruals companies with non-profitable risks.

Chart 2.2 Return on Assets Statistics of Accruals Quintile Group



Notes: The box plot is calculated by using the return on assets (ROA) from the five accruals quintile in the global equity universe, from 08/31/2000 to 08/31/2019.

Sources: FCF Advisors, FactSet.



Use Free Cash Flow to Improve the Accrual Anomaly

We filter the lowest accruals group by checking the constituents' current free cash flow level as compared to their respective portfolio return. We find that companies with positive current free cash flow not only significantly outperform the negative peer group on both an absolute and risk-adjusted basis, but also reverse the underperformance to the benchmark on a risk-adjusted basis. Tables 2.3 and 2.4 show the results from an equal-weighted and cap-weighted perspective, respectively. In the lowest accrual group portfolio, equal-weighted positive free cash flow companies produce an annual excess return of 4.43% (14.42% - 9.99%) over the total lowest accrual group portfolio and an increase in Sharpe ratio of 0.30 (0.76 - 0.46). On a cap-weighted basis, the positive free cash flow group produces an annual excess return of 1.84% (7.48% - 5.64%) and an increase in Sharpe ratio of 0.12 (0.42 - 0.30) over the total lowest accrual group cap-weighted portfolio. The use of free cash flow mitigates the tail risk of non-profitable low accrual companies while maintaining the benefit of sustained profitability.

Table 2.3 Global Equal-Weighted Lowest Accruals Quintile Portfolio Performance, 08/31/2000 to 08/31/2019

Companies with Positive Free Cash Flows versus Negative Free Cash Flows

Portfolio	Performance Measures	Positive Free Cash Flow	Negative Free Cash Flow	Total	Benchmark
Accruals Group (Lowest)	Annual Return	14.42%	0.17%	9.99%	7.72%
	Annual Volatility	18.96%	28.83%	21.70%	18.42%
	Sharpe Ratio	0.76	0.01	0.46	0.42

Sources: FCF Advisors; FactSet.

Table 2.4 Global Cap-Weighted Lowest Accruals Quintile Portfolio Performance, 08/31/2000 to 08/31/2019

Companies with Positive Free Cash Flows versus Negative Free Cash Flows

Portfolio	Performance Measures	Positive Free Cash Flow	Negative Free Cash Flow	Total	Benchmark
Accruals Group (Lowest)	Annual Return	7.48%	-2.88%	5.64%	5.46%
	Annual Volatility	17.99%	24.65%	19.05%	15.52%
	Sharpe Ratio	0.42	-0.12	0.30	0.35

Sources: FCF Advisors; FactSet.



Free Cash Flow Factor: Combining Strong and Sustainable Profitability

Informed by the research on free cash flow and accruals, we introduce the proprietary FCF Advisors Free Cash Flow Factor that combines both strong current cash profitability and cash flow-adjusted accruals to predict the persistence of earnings. Again, we first look at the overall performance of the global quintile portfolio. At each month-end, we rank all the stocks in the global equity universe by free cash flow factor score and apply the equal-weighted and cap-weighted approach to form two sets of portfolios. Table 3.1 shows that both the equal-weighted and cap-weighted free cash flow factor portfolio in the top quintile outperform the benchmark by 6.63% (14.35% - 7.72%) and 3.79% (9.25% - 5.46%) respectively and yield an increase in Sharpe ratio from 0.42 and 0.35 to 0.78 and 0.60, respectively.

Table 3.1 Free Cash Flow Factor Quintile Portfolio Performance
Global Equity Universe, 08/31/2000 to 08/31/2019

Weighting	Performance Measures	5 (Highest)	4	3	2	1 (Lowest)
Equal-Weighted Free Cash Flow Factor	Annual Return	14.35%	10.52%	7.15%	5.00%	0.27%
	Annual Volatility	18.44%	17.62%	19.48%	18.86%	21.57%
	Sharpe Ratio	0.78	0.60	0.37	0.27	0.01
Equal-Weighted Benchmark	Annual Return	7.72%				
	Annual Volatility	18.42%				
	Sharpe Ratio	0.42				
Cap-Weighted Free Cash Flow Factor	Annual Return	9.25%	6.06%	4.47%	2.44%	-0.59%
	Annual Volatility	15.55%	14.68%	16.15%	17.10%	20.19%
	Sharpe Ratio	0.60	0.41	0.28	0.14	-0.03
Cap-Weighted Benchmark	Annual Return	5.46%				
	Annual Volatility	15.52%				
	Sharpe Ratio	0.35				

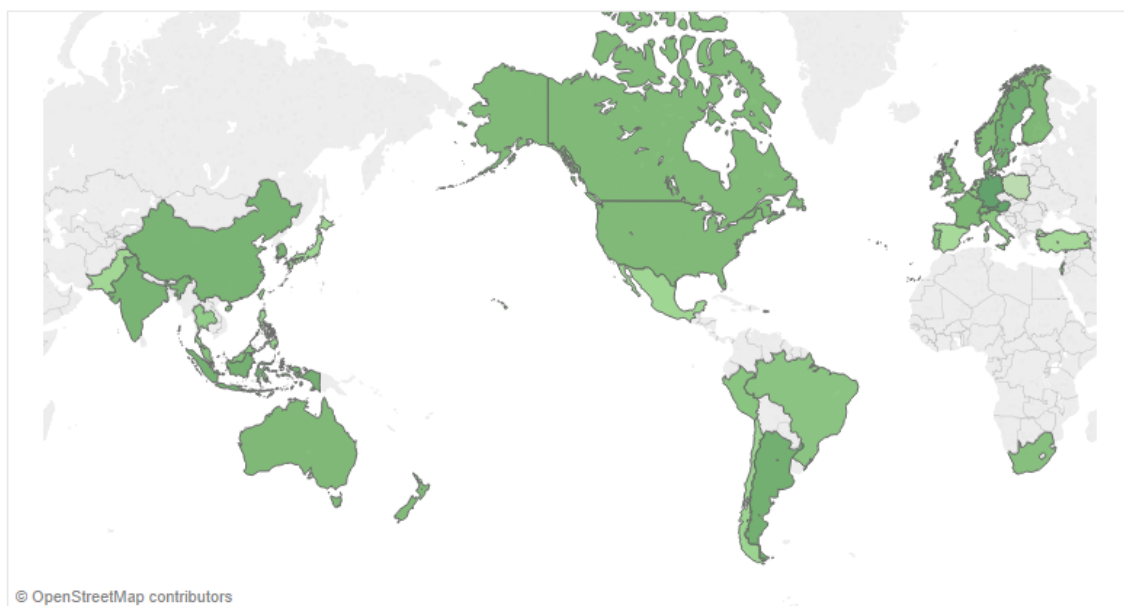


Global Outperformance of the Free Cash Flow Factor

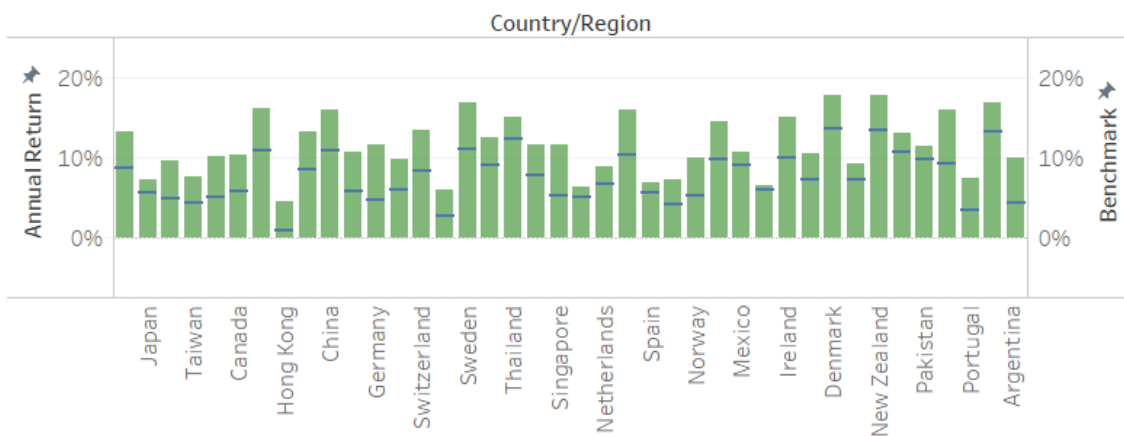
The quintile portfolio backtest provides the overall performance of the free cash flow factor; however, this performance can involve risks that aren't observable. Country/Region allocation risk is a good example of one because the distribution of the number and total market cap of stocks is imbalanced across the country. Consequently, it's important to go a step further and look at the free cash flow factor performance within each country/region.

Chart 3.1 shows the average annual excess return of stocks that have a free cash flow factor ranking larger than 50% to their peers within the country/region. We find that among the 38 countries/regions we backtested, only one country/region (Mexico) has slightly underperformed with high free cash flow factor exposure. Many markets display considerable excess returns.

Chart 3.1 Average Annual Excess Return for Stocks with Free Cash Flow Factor Exposure > 50%



Annual Excess Return



Portfolio ■ Benchmark

■ Free Cash Flow Factor > 50%



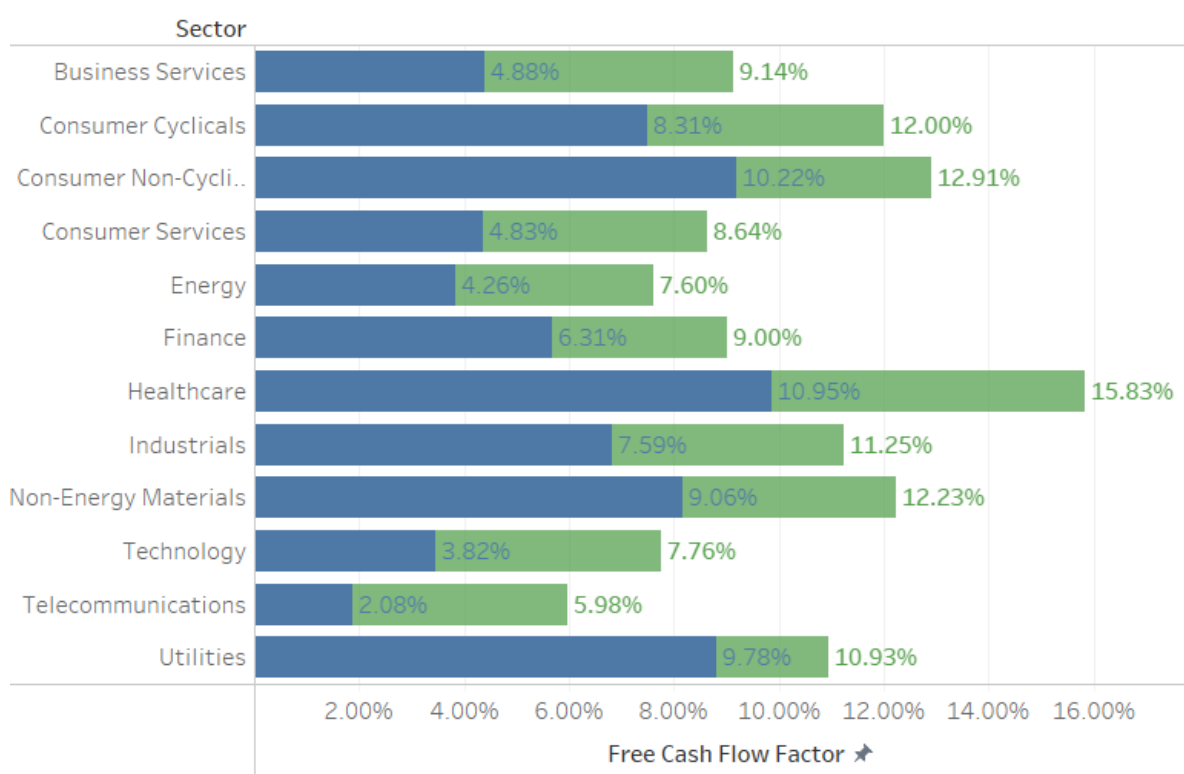
Notes: Global equity universe from 08/31/2000 to 08/31/2019. The average annual return of the Free Cash Flow Factor > 50% is calculated by annualizing the average monthly return of a basket of stocks in the top 50% based on the free cash flow factor ranking in each country/region. The annual excess return is calculated by subtracting the average annual return of all stocks in the country/region from the free cash flow factor > 50% basket.

Sources: FCF Advisors, FactSet.

Sector Outperformance of the Free Cash Flow Factor

Another aspect of performance attribution we monitor is sector allocations. Again, because the distribution of stocks in the different sectors is imbalanced, the outperformance of a portfolio is subject to allocation effects, which leads to over and underweighting of individual sectors. Here, it's the selection effect that is important when examining the performance of the free cash flow factor. We calculate the average annual return of stocks in the different sectors and compare them with the average annual return of all the stocks in the sector. As can be seen in Chart 3.2, in every sector, stocks with high free cash flow factor exposure (>50%) outperform the sector average, without any noticeable skewness in that sector outperformance.

Chart 3.2 Average Annual Average Excess Return for Stocks with Free Cash Flow Factor Exposure > 50%



Measure Names

■ Benchmark ■ Free Cash Flow Factor

Notes: Global equity universe from 08/31/2000 to 08/31/2019. The average annual return of the Free Cash Flow Factor > 50% is calculated by annualizing the average monthly return of a basket of stocks in the top 50% based on the free cash flow factor ranking in each sector. The annual excess return is calculated by subtracting the average annual return of all stocks in the sector.

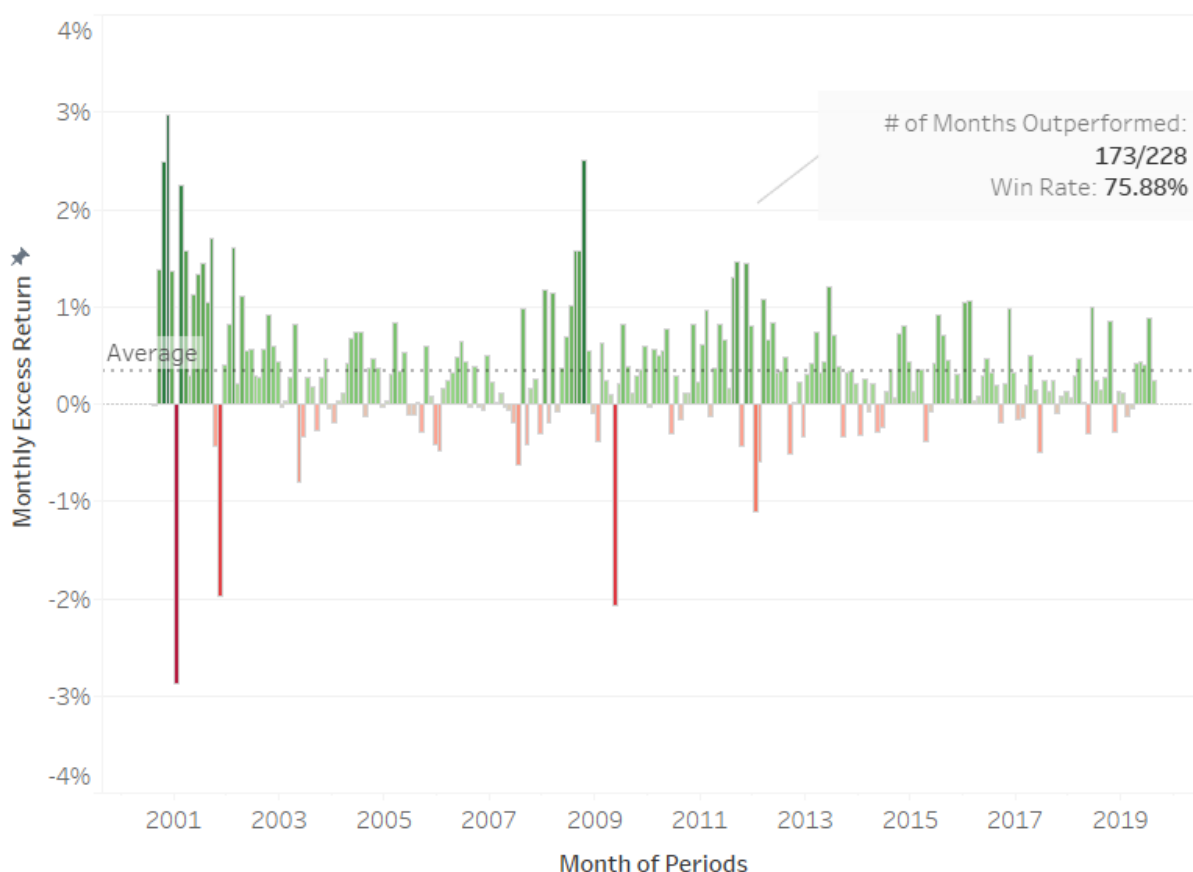
Sources: FCF Advisors, FactSet.



Consistent Alpha Generation of the Free Cash Flow Factor

One important thing that portfolio managers and researchers find relevant but often ignore is how consistent the factor performs – what we call the “win rate.” The win rate is defined as the number of months the portfolio outperformed the benchmark divided by the total number of months in the analysis. Chart 3.3 shows that the stocks with high free cash flow exposure outperform the average market return in 173 months out of 228 months from 08/31/2000 to 08/31/2019, resulting in a 75.88% win rate.

Chart 3.3 Monthly Excess Return for Stocks with Free Cash Flow Factor Exposure > 50%



Notes: Global equity universe from 08/31/2000 to 08/31/2019. The monthly excess return of the Free Cash Flow Factor > 50% is calculated by taking the monthly average return of a basket of stocks in the top 50% based on the overall free cash flow factor ranking and subtracting the monthly average return of all stocks in the universe.

Sources: FCF Advisors, FactSet.

FCF Indexes: Opportunity to Invest in Free Cash Flow Factor

Informed by the fundamental ideas presented in this paper and significant additional other in-depth proprietary research, FCF Indexes, a subsidiary of FCF Advisors, was founded to provide investors with access to our Free Cash Flow Factor models. FCF Indexes seeks to measure the performance of companies in different capitalization segments of the global equity market by two free cash flow-based factors: strong free cash flows return on capital and sustainable profitability, as compared to their peer groups.



Notes on inclusion into the Free Cash Flow Indexes:

To be considered for inclusion, companies must have reported free cash flows and other necessary financial statement items to be included in the underlying universe. Financial companies that don't have standard free cash flows calculation are excluded. The index is rebalanced quarterly and weighted by factor-tile market capitalization. A proprietary optimization model is applied at each rebalancing to control index turnover and the number of constituents while maximizing target factors exposure.

Table 4 Current FCF Advisors SMA Performance

Performance As of 12/31/21 Since Inception (US: 3/18/2021, Intl.: 4/28/2021)	Net Return*	+/- (NR)
FCF US Quality Dividend SMA	16.43%	3.52%
Russell 1000 Value TR USD	12.91%	
FCF US Quality Innovation SMA	19.90%	-9.42%
Russell 1000 Growth TR USD	29.32%	
FCF US Small Cap Quality SMA	16.40%	16.58%
Russell 2000 TR USD	-0.18%	
FCF US Defensive SMA	28.60%	7.64%
Russell 1000 TR USD	20.96%	
FCF Global Ex-US Quality Innovation SMA	-1.19%	-1.35%
MSCI ACWI Ex USA Growth NR USD	0.16%	
Assets Weighted Return	16.07%	2.78%
Benchmark Weighted Return	13.29%	

* Return Based on Market Value / Initial Investment, Net of Account Fee and Transaction Costs



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