



*An Examination of Abnormal Returns Generated  
by the Cash Flow Analytics™ Proprietary Model*

*Version 3: For General Distribution  
(Excludes Identification of Cash Flow Analytics™ Model Signals,  
Results Using Daily Returns, and Risk Analysis)*

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## 1. INTRODUCTION

It is difficult to overstate the importance of cash flow to our fundamental concepts of financial performance and valuation. Consider, for example, the following observations made in the financial press,

“Free cash flow is the lifeblood of a company,” Fischer (2002).

“Unless a company can generate cash to fund growth and pay dividends, its shares are essentially worthless,” Rappaport (2004).

“If you want a fair measure of extractable cash, the ultimate end in running a business, try free cash flow,” Hanke (2004).

Business managers too have gained an appreciation for the importance of cash flow to investors. Consider Borders Group, Inc., for example, “The Company is continuing to implement its plan . . . to improve sales, net income and free cash flow,” Borders Group, Inc. (2004). At Amazon.com, Inc., a spokesperson made the following comment, “We think all the GAAP numbers are important, but the one management is most focused on is free cash flow.”<sup>1</sup>

Professional investors also agree on the importance of cash flow to investment valuation. Cash flow, defined many different ways, is often found in proprietary valuation and trading models.

Traditional measures of cash flow are typically based on GAAP-defined calculations of operating cash flow. However, as documented extensively in *Financial Warnings* (Mulford and Comiskey, 1996), *The Financial Numbers Game: Detecting Creative Accounting Practices* (Mulford and Comiskey, 2002), and especially, *Creative Cash Flow Reporting: Uncovering Sustainable Financial Performance* (Mulford and Comiskey, 2005), cash flow measures based on GAAP are easily open to manipulation and are often misleading. The use of cash flow measures based on reported results can hurt trading effectiveness and limit returns.

In this paper, we report the development and testing of the Cash Flow Analytics™ stock selection-scoring model. It is a model whose foundation is based on the Cash Flow Analytics™ proprietary calculations of cash flow and does not employ unreliable company-reported cash flow measures. Beyond its important cash flow-based foundation, the model uses other proprietary metrics that capture varying attributes of financial performance and position, including profitability, efficiency, leverage and valuation.

Using a comprehensive dataset of all non-financial firms contained in the COMPUSTAT database, we empirically test our model using data from 1998 through 2005, a period that includes both up and down markets.

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<sup>1</sup> B. Curry, a spokesperson for Amazon.com, Inc., as quoted by Wingfield (2003).

The results indicate that the Cash Flow Analytics™ model is effective in generating abnormal returns for small and mid-capitalization stocks (those with market caps up to approximately \$3 billion). The model is most effective in selecting small market capitalization stocks (those with market caps of up to approximately \$1.4 billion). For these small market capitalization firms we find that high score firms outperform a size-based benchmark up to 79.3% of the time with abnormal returns of up to 13.3% per year. Low score firms underperform a size benchmark 93.1% of the time with abnormal returns of up to 19.1% per annum. An examination of a zero investment strategy indicates that high score firms outperform low score firms by as much as 35.0% per year. Additional analyses show that abnormal returns are maintained even when controls are included for risk and stock-price momentum or when illiquid stocks are removed. Moreover, we find that model-based holding periods are at least three months in length and for 25% of the identified stocks, holding periods are six months or longer.

## *2. MODEL DEVELOPMENT*

The Cash Flow Analytics™ stock selection-scoring model employs seven signals that can be classified into five broad categories of financial performance and position: cash flow, profitability, operating efficiency, financial leverage and valuation. The signals employ Cash Flow Analytics™ proprietary data. Each signal is computed for each firm and an overall score is created that ranges between 0 and 7.

## *3. DATA AND METHODS*

The sample consists of all non-financial firms listed in COMPUSTAT for which price and accounting information is available between 1998 and 2005. All financial statement data used are based on a rolling four-quarter (annual) period. Thus, the data updates on average once per quarter.

Firms are sorted into portfolios based upon their market capitalization and their Cash Flow Analytics™ model score and an average daily return is calculated for each portfolio. Firms are assigned to market capitalization portfolios each month and are assigned to Cash Flow Analytics™ score portfolios as new accounting information becomes available each quarter, allowing for a revised measure of four-quarter results.

## *4. RESULTS*

### *DISTRIBUTION AND PERSISTENCE OF THE SCORE*

In this section, we examine the distribution of the Cash Flow Analytics™ score. Table 2 reports the average number of firms in the daily portfolios by size quintile across the 1998 to 2005 time period. The Table also identifies the market capitalization for each quintile. In the smallest quintile, with a market cap as of February 2006 of \$700 million or less, the

high score portfolio (score of 6 or 7) has on average 175.53 firms, while the low score portfolio (score of 0 or 1) has on average 249.62 firms. Moving from the smallest to the largest market capitalization quintiles, both the number of high score firms and low score firms decrease considerably. At the largest size quintile, with a market cap of \$8.8 billion or more, the high score portfolio has on average 26.72 firms while the low score portfolio has on average 32.36 firms. Across all quintiles, approximately 10% have scores of 6 or 7 while 14% of firms have scores of 0 or 1. These stocks, the firms with high scores of 6 or 7, which are projected to outperform their index, and firms with low scores of 0 or 1, which are projected to underperform their index, are the focus of our analysis.

*Table 2. Number of Firms in Each Size Quintile and Cash Flow Analytics™ Score Group*

	<i>Distribution of the score</i>		
	<i>Low Score: 0 or 1</i>	<i>Middle Score: 2 through 5</i>	<i>High Score: 6 or 7</i>
Quintile 1: \$700 million or less	249.62	1388.18	175.53
Quintile 2: \$700 million - 1.4 billion	81.64	394.16	47.88
Quintile 3: \$1.4 billion - \$3.0 billion	51.38	286.00	36.25
Quintile 4: \$3.0 billion - \$8.8 billion	43.95	241.09	29.98
Quintile 5: \$8.8 billion or more	32.36	217.50	26.72

This table shows the market capitalization of each size quintile and the average number of firms in the daily portfolios between 1998 and 2005.

*Note: Table 1 is not presented in this version of the paper.*

In unreported results, we examine the median length of time that a firm remains a high score (6 or 7) or a low score (0 or 1) firm. Specifically, we look at the first instance that a firm enters either of the extreme score portfolios and track how long it remains in that portfolio. High score firms remain in the high score portfolio for an average of approximately one quarter. Approximately 25% of firms will remain a high score firm for 2 quarters or longer. A similar result holds for low score firms.

### *RETURNS TO THE CASH FLOW ANALYTICS™ SCORE STRATEGY*

In this section, we examine the average daily return to investing in firms with high and low Cash Flow Analytics™ model scores. Since the performance of this strategy is likely to vary by market capitalization, we examine performance by size quintiles. Abnormal returns are calculated with respect to an equally-weighted portfolio of all stocks within the same quintile. This size benchmark includes only firms in our sample, and consequently, excludes financial firms.

Our initial results, presenting average annualized abnormal returns, calculated by subtracting the size-based benchmark returns from the actual returns, are presented in Table 3.

*Table 3. Annualized Abnormal Returns to High and Low Cash Flow Analytics™ Score Firms*

<i>Portfolio</i>	<i>High Score</i>	<i>Low Score</i>	<i>High Score – Low Score</i>
Quintile 1	13.3%***	-19.1%***	35.0%***
Quintile 2	10.5%***	-10.5%***	22.1%***
Quintile 3	5.1%	-5.1%**	10.5%**
Quintile 4	-5.1%	-7.8%***	2.5%
Quintile 5	7.8%	-2.5%	5.1%

This table reports annualized abnormal return to the high and low Cash Flow Analytics™ score firms. High score firms are those with model scores of 6 or 7. Low score firms are those with model scores of 0 or 1. The sample period spans the period from 1998 to 2005. Results are reported by market capitalization quintile. Abnormal returns are calculated with respect to an equally weighted portfolio of all stocks within the same quintile. \*\*\*, \*\*, and \* represent statistical significance at the 1%, 5%, and 10% levels respectively.

In addition to the results reported here, we calculated annualized abnormal returns for mid-range scores. In quintile 1 and quintile 2, annualized abnormal returns for scores 4 and 5 were 7.8% and 5.1%, respectively. In quintile 1, annualized abnormal returns for scores 2 and 3 was -2.5%.

As noted in Table 3, high score firms in quintile 1 outperform the benchmark by a statistically and economically meaningful amount of 13.3% per annum. In quintile 2 the abnormal return is 10.5% per annum. High score firms in quintiles 3, 4 and 5 do not outperform the benchmark.

The results for low score firms are more robust. Low score firms in every market capitalization quintile except for the largest quintile significantly underperform the benchmark. Firms in quintile 1 underperform the benchmark by 19.1% per annum, and in quintile 2 they underperform by 10.5% per annum.

The final column of Table 3 examines the returns of high score firms in excess of low score firms. The results indicate that for the smallest two quintiles, high score firms outperform low score firms by a statistically significant 22.1% to 35.0% per annum. This abnormal performance falls to 10.5% for quintile 3. Firms with high scores do not significantly outperform firms with low Cash Flow Analytics™ scores for the largest two quintiles.

Tables Four through Eight expand on the average daily returns reported in Table 3 by showing the relative performance of the high versus low Cash Flow Analytics™ score firms on a quarter by quarter basis between 1998 and 2005 for each size quintile. Relative performance is measured using an index of non-financial firms matched by size (Table column labeled “index”). For reference, the return to a value-weighted broad market index of all capitalization stocks traded on the NYSE, ASE and NASDAQ is provided (Table column labeled “market return”). The general conclusion remains the same – high Cash Flow Analytics™ score firms significantly outperform low Cash Flow Analytics™ score firms, especially in quintiles 1 and 2.

Table Four examines the quarterly performance of the high and low score firms in quintile 1. High score firms outperform the size benchmark by approximately 3.52% per quarter, while low score firms underperform the benchmark by 4.24% per quarter. These results are economically and statistically meaningful and generally robust across quarters. High score firms outperform the benchmark in 79.31% of the quarters, while low score firms underperform the benchmark in 93.1% of the quarters. High score firms outperform low score firms by 7.76% per quarter, on average, and in 93.1% of the quarters examined. Examination of the median returns leads to similar conclusions, indicating that skewness is not a significant issue.

Table Five performs a similar analysis for firms in quintile 2. The results are qualitatively similar. High score firms outperform the size benchmark by 2.59% per quarter, on average, and outperform the benchmark in 75.86% of the quarters examined. Low score firms underperform the size benchmark by approximately 2.31% per quarter and underperform the benchmark in 72.41% of the quarters examined. High score firms outperform low score firms by approximately 4.90% per quarter and in 79.31% of the quarters examined.

The remaining Tables examine the abnormal performance of high score and low score firms for the remaining size quintiles. Generally, the effectiveness of the Cash Flow Analytics™ model declines as firm size increases. For example, in Table 6, where we present data for quintile 3 firms, the high score firms outperform the size benchmark by 1.06 % per quarter, on average, and do so in 62.1% of the quarters examined. Low score firms underperform the size benchmark by approximately 1.29% per quarter and underperform the benchmark in 62.1% of the quarters examined. Also, as reported in Table 8, in quintile 5, high score firms outperform their benchmark by 2.12% per quarter, while low score in this quintile underperform the benchmark by 0.47%.

**Table 4. Quarter by Quarter Performance of the Cash Flow Analytics™ Score for Quintile 1**

This table shows the quarterly performance of the Cash Flow Analytics™ Score for stocks in quintile 1. The sample period spans the period 1998 to 2005. High score firms are those with scores of 6 or 7, while low score firms are those with scores of 0 or 1. For reference purposes, the return to a value-weighted broad market index of all capitalization stocks is provided (market return). Differences between an annualized amount of the mean abnormal returns reported here the results reported in Table 3 reflect primarily the effects of rounding and the fact that Table 3 reports differences in daily returns.

<b>QTR</b>	<b>High Score</b>	<b>Low Score</b>	<b>Index</b>	<b>High Score - Index</b>	<b>Low Score - Index</b>	<b>High - Low</b>	<b>Market Return</b>
19984	34.01%	14.54%	16.49%	17.52%	-1.95%	19.47%	21.27%
19991	-9.87%	1.00%	5.38%	-15.25%	-4.37%	-10.87%	3.71%
19992	23.76%	19.35%	21.62%	2.14%	-2.27%	4.41%	8.06%
19993	-0.84%	-6.13%	0.52%	-1.35%	-6.65%	5.29%	-6.12%
19994	25.45%	15.84%	23.41%	2.04%	-7.57%	9.61%	19.53%
20001	31.85%	24.38%	32.90%	-1.05%	-8.52%	7.47%	4.14%
20002	-3.16%	-12.55%	-11.86%	8.70%	-0.69%	9.39%	-4.88%
20003	9.29%	-4.60%	0.64%	8.65%	-5.25%	13.90%	0.36%
20004	-20.90%	-30.46%	-23.95%	3.05%	-6.51%	9.56%	-10.79%
20011	22.38%	8.78%	16.28%	6.11%	-7.50%	13.60%	-12.79%
20012	22.30%	16.47%	22.26%	0.04%	-5.80%	5.84%	7.61%
20013	-13.01%	-27.39%	-19.00%	5.99%	-8.40%	14.38%	-16.05%
20014	32.08%	37.04%	33.62%	-1.53%	3.43%	-4.96%	12.92%
20021	19.14%	1.49%	9.42%	9.72%	-7.93%	17.64%	0.56%
20022	0.93%	-15.47%	-9.57%	10.50%	-5.91%	16.41%	-12.58%
20023	-14.02%	-23.07%	-18.77%	4.75%	-4.30%	9.05%	-16.65%
20024	19.90%	10.37%	19.18%	0.71%	-8.81%	9.52%	7.95%
20031	1.22%	-0.03%	2.44%	-1.22%	-2.47%	1.25%	-2.88%
20032	52.69%	40.21%	46.60%	6.08%	-6.39%	12.48%	17.02%
20033	30.88%	19.58%	24.82%	6.07%	-5.24%	11.30%	3.88%
20034	27.38%	15.70%	20.68%	6.70%	-4.98%	11.69%	12.71%
20041	14.03%	7.71%	12.64%	1.39%	-4.93%	6.32%	2.77%
20042	-2.33%	-3.27%	-1.44%	-0.89%	-1.83%	0.94%	1.06%
20043	-2.33%	-8.34%	-6.69%	4.36%	-1.65%	6.01%	-1.52%
20044	27.51%	20.92%	22.72%	4.79%	-1.81%	6.59%	10.46%
20051	-3.47%	-9.58%	-7.36%	3.89%	-2.22%	6.11%	-2.14%
20052	4.60%	1.41%	1.14%	3.46%	0.27%	3.19%	2.29%
20053	13.33%	5.25%	7.75%	5.58%	-2.50%	8.07%	4.81%
20054	1.63%	0.12%	0.37%	1.26%	-0.25%	1.52%	2.24%
<b>Mean</b>	11.88%	4.11%	8.35%	3.52%	-4.24%	7.76%	1.96%
<b>Median</b>	13.33%	1.49%	7.75%	3.89%	-4.93%	8.07%	2.29%
<b>Minimum</b>	-20.90%	-30.46%	-23.95%	-15.25%	-8.81%	-10.87%	-16.65%
<b>Maximum</b>	52.69%	40.21%	46.60%	17.52%	3.43%	19.47%	21.27%
<b>% Positive</b>	68.97%	62.07%	72.41%	79.31%	6.90%	93.10%	65.52%

**Table 5. Quarter by Quarter Performance of the Cash Flow Analytics™ Score for Quintile 2**

This table shows the quarterly performance of the Cash Flow Analytics™ Score for stocks in quintile 2. The sample period spans the period 1998 to 2005. High score firms are those with scores of 6 or 7, while low score firms are those with scores of 0 or 1. For reference purposes, the return to a value-weighted broad market index of all capitalization stocks is provided (market return). Differences between an annualized amount of the mean abnormal returns reported here the results reported in Table 3 reflect primarily the effects of rounding and the fact that Table 3 reports differences in daily returns.

<b>QTR</b>	<b>High Score</b>	<b>Low Score</b>	<b>Index</b>	<b>High Score - Index</b>	<b>Low Score - Index</b>	<b>High - Low</b>	<b>Market Return</b>
19984	22.21%	18.37%	20.38%	1.84%	-2.00%	3.84%	21.27%
19991	-1.95%	-1.27%	-4.31%	2.36%	3.04%	-0.68%	3.71%
19992	38.14%	29.31%	28.92%	9.22%	0.39%	8.83%	8.06%
19993	-3.22%	-5.97%	-2.49%	-0.73%	-3.48%	2.74%	-6.12%
19994	25.41%	22.07%	24.26%	1.14%	-2.19%	3.34%	19.53%
20001	15.96%	15.49%	21.85%	-5.89%	-6.36%	0.47%	4.14%
20002	5.62%	-3.08%	1.29%	4.33%	-4.37%	8.70%	-4.88%
20003	4.38%	-8.70%	0.39%	3.99%	-9.09%	13.08%	0.36%
20004	1.80%	-24.23%	-11.89%	13.69%	-12.35%	26.03%	-10.79%
20011	7.72%	-1.56%	1.87%	5.85%	-3.43%	9.28%	-12.79%
20012	31.53%	30.68%	35.11%	-3.58%	-4.43%	0.85%	7.61%
20013	-18.15%	-27.80%	-22.83%	4.69%	-4.96%	9.65%	-16.05%
20014	36.62%	34.99%	38.27%	-1.65%	-3.28%	1.63%	12.92%
20021	11.28%	4.56%	6.69%	4.58%	-2.13%	6.72%	0.56%
20022	-2.67%	-8.81%	-6.79%	4.12%	-2.02%	6.14%	-12.58%
20023	-16.12%	-16.03%	-19.85%	3.73%	3.83%	-0.10%	-16.65%
20024	16.86%	20.12%	15.57%	1.29%	4.55%	-3.26%	7.95%
20031	-3.98%	-2.13%	-2.07%	-1.91%	-0.06%	-1.85%	-2.88%
20032	35.34%	30.42%	33.65%	1.68%	-3.23%	4.92%	17.02%
20033	18.20%	9.30%	15.97%	2.24%	-6.67%	8.90%	3.88%
20034	24.19%	16.79%	19.64%	4.55%	-2.85%	7.40%	12.71%
20041	12.98%	9.21%	8.64%	4.34%	0.57%	3.77%	2.77%
20042	7.95%	1.79%	3.82%	4.13%	-2.03%	6.16%	1.06%
20043	2.17%	-4.07%	-2.08%	4.25%	-1.99%	6.24%	-1.52%
20044	18.45%	15.95%	18.27%	0.17%	-2.32%	2.49%	10.46%
20051	5.13%	-4.47%	-1.13%	6.26%	-3.34%	9.61%	-2.14%
20052	3.01%	5.34%	4.74%	-1.72%	0.60%	-2.33%	2.29%
20053	10.62%	8.06%	7.06%	3.56%	1.00%	2.56%	4.81%
20054	1.51%	4.47%	2.82%	-1.31%	1.65%	-2.96%	2.24%
<b>Mean</b>	10.72%	5.82%	8.13%	2.59%	-2.31%	4.90%	1.96%
<b>Median</b>	7.95%	4.56%	4.74%	3.56%	-2.19%	3.84%	2.29%
<b>Minimum</b>	-18.15%	-27.80%	-22.83%	-5.89%	-12.35%	-3.26%	-16.65%
<b>Maximum</b>	38.14%	34.99%	38.27%	13.69%	4.55%	26.03%	21.27%
<b>% Positive</b>	79.31%	58.62%	68.97%	75.86%	27.59%	79.31%	65.52%

**Table 6. Quarter by Quarter Performance of the Cash Flow Analytics™ Score for Quintile 3**

This table shows the quarterly performance of the Cash Flow Analytics™ Score for stocks in quintile 3. The sample period spans the period 1998 to 2005. High score firms are those with scores of 6 or 7, while low score firms are those with scores of 0 or 1. For reference purposes, the return to a value-weighted broad market index of all capitalization stocks is provided (market return). Differences between an annualized amount of the mean abnormal returns reported here the results reported in Table 3 reflect primarily the effects of rounding and the fact that Table 3 reports differences in daily returns.

<b>QTR</b>	<b>High Score</b>	<b>Low Score</b>	<b>Index</b>	<b>High Score - Index</b>	<b>Low Score - Index</b>	<b>High - Low</b>	<b>Market Return</b>
19984	14.36%	21.30%	19.29%	-4.93%	2.01%	-6.94%	21.27%
19991	-8.82%	-0.46%	-2.83%	-5.99%	2.37%	-8.36%	3.71%
19992	17.57%	17.34%	24.08%	-6.50%	-6.74%	0.23%	8.06%
19993	2.08%	-4.95%	-0.59%	2.68%	-4.36%	7.04%	-6.12%
19994	17.94%	31.56%	23.75%	-5.81%	7.81%	-13.62%	19.53%
20001	9.89%	20.55%	20.88%	-11.00%	-0.33%	-10.67%	4.14%
20002	10.79%	-0.05%	4.89%	5.90%	-4.94%	10.83%	-4.88%
20003	7.93%	5.88%	7.71%	0.22%	-1.83%	2.05%	0.36%
20004	14.14%	-12.74%	-0.33%	14.47%	-12.41%	26.88%	-10.79%
20011	1.39%	-9.45%	-4.39%	5.77%	-5.06%	10.84%	-12.79%
20012	21.48%	22.83%	24.06%	-2.58%	-1.22%	-1.36%	7.61%
20013	-16.48%	-26.50%	-19.77%	3.30%	-6.73%	10.02%	-16.05%
20014	29.54%	42.31%	35.52%	-5.98%	6.79%	-12.77%	12.92%
20021	11.81%	3.54%	7.96%	3.85%	-4.42%	8.27%	0.56%
20022	-3.83%	-8.70%	-10.44%	6.61%	1.74%	4.87%	-12.58%
20023	-13.53%	-23.26%	-16.03%	2.50%	-7.23%	9.73%	-16.65%
20024	21.14%	18.29%	15.63%	5.51%	2.66%	2.85%	7.95%
20031	-2.66%	-3.17%	-2.27%	-0.39%	-0.91%	0.51%	-2.88%
20032	24.21%	27.46%	28.25%	-4.04%	-0.79%	-3.25%	17.02%
20033	10.23%	10.06%	10.79%	-0.57%	-0.73%	0.16%	3.88%
20034	21.19%	15.95%	18.05%	3.15%	-2.10%	5.24%	12.71%
20041	13.60%	9.16%	8.50%	5.10%	0.66%	4.44%	2.77%
20042	6.02%	1.48%	3.32%	2.70%	-1.84%	4.54%	1.06%
20043	0.55%	1.16%	-0.67%	1.22%	1.83%	-0.61%	-1.52%
20044	21.50%	15.42%	15.31%	6.19%	0.11%	6.08%	10.46%
20051	-1.18%	0.36%	-0.81%	-0.37%	1.17%	-1.54%	-2.14%
20052	6.42%	4.23%	4.45%	1.97%	-0.22%	2.20%	2.29%
20053	14.30%	3.97%	7.60%	6.70%	-3.63%	10.33%	4.81%
20054	5.03%	4.88%	3.95%	1.09%	0.94%	0.15%	2.24%
<b>Mean</b>	8.85%	6.50%	7.79%	1.06%	-1.29%	2.35%	1.96%
<b>Median</b>	10.23%	4.23%	7.60%	1.97%	-0.79%	2.20%	2.29%
<b>Minimum</b>	-16.48%	-26.50%	-19.77%	-11.00%	-12.41%	-13.62%	-16.65%
<b>Maximum</b>	29.54%	42.31%	35.52%	14.47%	7.81%	26.88%	21.27%
<b>% Positive</b>	79.31%	68.97%	65.52%	62.07%	37.93%	68.97%	65.52%

**Table 7. Quarter by Quarter Performance of the Cash Flow Analytics™ Score for Quintile 4**

This table shows the quarterly performance of the Cash Flow Analytics™ Score for stocks in quintile 4. The sample period spans the period 1998 to 2005. High score firms are those with scores of 6 or 7, while low score firms are those with scores of 0 or 1. For reference purposes, the return to a value-weighted broad market index of all capitalization stocks is provided (market return). Differences between an annualized amount of the mean abnormal returns reported here the results reported in Table 3 reflect primarily the effects of rounding and the fact that Table 3 reports differences in daily returns.

<b>QTR</b>	<b>High Score</b>	<b>Low Score</b>	<b>Index</b>	<b>High Score - Index</b>	<b>Low Score - Index</b>	<b>High - Low</b>	<b>Market Return</b>
19984	-6.86%	9.02%	8.95%	-15.81%	0.07%	-15.88%	21.27%
19991	-8.09%	-5.85%	0.67%	-8.76%	-6.51%	-2.25%	3.71%
19992	25.81%	17.96%	22.35%	3.46%	-4.40%	7.86%	8.06%
19993	-4.35%	-1.96%	-3.13%	-1.22%	1.18%	-2.40%	-6.12%
19994	11.93%	32.28%	21.44%	-9.51%	10.84%	-20.35%	19.53%
20001	16.81%	14.70%	18.17%	-1.36%	-3.47%	2.11%	4.14%
20002	7.97%	-0.41%	6.47%	1.51%	-6.88%	8.38%	-4.88%
20003	0.71%	8.15%	8.07%	-7.36%	0.08%	-7.44%	0.36%
20004	4.63%	-10.10%	-0.32%	4.95%	-9.78%	14.73%	-10.79%
20011	5.49%	-13.81%	-6.97%	12.46%	-6.84%	19.30%	-12.79%
20012	6.46%	25.87%	20.87%	-14.41%	5.00%	-19.41%	7.61%
20013	-13.21%	-22.08%	-17.29%	4.07%	-4.79%	8.87%	-16.05%
20014	23.90%	21.04%	27.35%	-3.45%	-6.31%	2.86%	12.92%
20021	3.77%	9.29%	7.63%	-3.86%	1.66%	-5.52%	0.56%
20022	-12.18%	-10.79%	-11.20%	-0.98%	0.41%	-1.39%	-12.58%
20023	-11.77%	-13.28%	-14.68%	2.91%	1.41%	1.51%	-16.65%
20024	8.13%	12.68%	15.76%	-7.63%	-3.07%	-4.56%	7.95%
20031	-1.94%	-3.61%	-1.03%	-0.92%	-2.58%	1.67%	-2.88%
20032	28.44%	16.84%	23.78%	4.67%	-6.94%	11.60%	17.02%
20033	7.94%	7.40%	10.04%	-2.09%	-2.64%	0.55%	3.88%
20034	17.40%	16.90%	16.79%	0.61%	0.11%	0.50%	12.71%
20041	2.48%	6.85%	6.37%	-3.88%	0.49%	-4.37%	2.77%
20042	8.91%	-0.79%	3.76%	5.15%	-4.55%	9.70%	1.06%
20043	-3.32%	-3.18%	-0.65%	-2.67%	-2.53%	-0.14%	-1.52%
20044	11.29%	15.40%	14.71%	-3.43%	0.69%	-4.12%	10.46%
20051	2.27%	1.84%	1.45%	0.82%	0.40%	0.42%	-2.14%
20052	6.84%	0.48%	4.87%	1.97%	-4.39%	6.36%	2.29%
20053	12.52%	8.85%	8.31%	4.20%	0.54%	3.67%	4.81%
20054	4.76%	3.06%	3.55%	1.21%	-0.49%	1.70%	2.24%
<b>Mean</b>	5.40%	4.92%	6.76%	-1.36%	-1.84%	0.48%	1.96%
<b>Median</b>	5.49%	6.85%	6.47%	-0.98%	-2.53%	0.55%	2.29%
<b>Minimum</b>	-13.21%	-22.08%	-17.29%	-15.81%	-9.78%	-20.35%	-16.65%
<b>Maximum</b>	28.44%	32.28%	27.35%	12.46%	10.84%	19.30%	21.27%
<b>% Positive</b>	72.41%	62.07%	72.41%	44.83%	44.83%	58.62%	65.52%

**Table 8. Quarter by Quarter Performance of the Cash Flow Analytics™ Score for Quintile 5**

This table shows the quarterly performance of the Cash Flow Analytics™ Score for stocks in quintile 5. The sample period spans the period 1998 to 2005. High score firms are those with scores of 6 or 7, while low score firms are those with scores of 0 or 1. For reference purposes, the return to a value-weighted broad market index of all capitalization stocks is provided (market return). Differences between an annualized amount of the mean abnormal returns reported here the results reported in Table 3 reflect primarily the effects of rounding and the fact that Table 3 reports differences in daily returns.

<b>QTR</b>	<b>High Score</b>	<b>Low Score</b>	<b>Index</b>	<b>High Score - Index</b>	<b>Low Score - Index</b>	<b>High - Low</b>	<b>Market Return</b>
19984	39.18%	19.60%	17.05%	22.13%	2.55%	19.58%	21.27%
19991	-1.38%	3.56%	7.38%	-8.76%	-3.82%	-4.94%	3.71%
19992	25.91%	17.83%	15.83%	10.08%	2.00%	8.07%	8.06%
19993	1.61%	-9.97%	-2.96%	4.57%	-7.01%	11.58%	-6.12%
19994	23.95%	27.87%	26.33%	-2.38%	1.54%	-3.92%	19.53%
20001	17.46%	22.75%	16.21%	1.25%	6.54%	-5.29%	4.14%
20002	6.48%	12.02%	7.29%	-0.81%	4.73%	-5.54%	-4.88%
20003	8.60%	12.38%	9.16%	-0.56%	3.22%	-3.78%	0.36%
20004	8.20%	-12.35%	2.76%	5.44%	-15.11%	20.55%	-10.79%
20011	4.29%	-10.25%	-7.35%	11.64%	-2.90%	14.54%	-12.79%
20012	14.62%	11.22%	12.61%	2.01%	-1.40%	3.40%	7.61%
20013	-12.50%	-17.72%	-14.88%	2.38%	-2.84%	5.22%	-16.05%
20014	18.98%	29.29%	20.39%	-1.41%	8.89%	-10.31%	12.92%
20021	5.59%	5.19%	5.12%	0.47%	0.07%	0.40%	0.56%
20022	-7.28%	-7.93%	-9.28%	2.00%	1.35%	0.66%	-12.58%
20023	-17.69%	-8.17%	-12.29%	-5.40%	4.12%	-9.52%	-16.65%
20024	12.87%	5.83%	12.38%	0.49%	-6.55%	7.04%	7.95%
20031	1.77%	-0.02%	0.10%	1.66%	-0.12%	1.78%	-2.88%
20032	15.76%	18.52%	18.25%	-2.49%	0.27%	-2.76%	17.02%
20033	6.43%	4.13%	4.97%	1.46%	-0.84%	2.29%	3.88%
20034	18.26%	13.07%	15.07%	3.18%	-2.01%	5.19%	12.71%
20041	6.76%	2.25%	3.99%	2.77%	-1.74%	4.51%	2.77%
20042	6.29%	5.50%	4.80%	1.48%	0.69%	0.79%	1.06%
20043	1.08%	3.16%	0.85%	0.22%	2.30%	-2.08%	-1.52%
20044	12.54%	9.74%	12.52%	0.03%	-2.77%	2.80%	10.46%
20051	4.09%	-0.12%	0.71%	3.38%	-0.84%	4.21%	-2.14%
20052	5.41%	4.44%	3.16%	2.25%	1.28%	0.97%	2.29%
20053	10.87%	5.05%	7.98%	2.89%	-2.93%	5.82%	4.81%
20054	4.90%	1.15%	3.39%	1.51%	-2.24%	3.75%	2.24%
<b>Mean</b>	8.38%	5.79%	6.26%	2.12%	-0.47%	2.59%	1.96%
<b>Median</b>	6.48%	5.05%	5.12%	1.51%	-0.12%	2.29%	2.29%
<b>Minimum</b>	-17.69%	-17.72%	-14.88%	-8.76%	-15.11%	-10.31%	-16.65%
<b>Maximum</b>	39.18%	29.29%	26.33%	22.13%	8.89%	20.55%	21.27%
<b>% Positive</b>	86.21%	72.41%	82.76%	75.86%	48.28%	68.97%	65.52%

## 5. CONCLUDING COMMENTS

In this paper, we develop and examine the effectiveness of the Cash Flow Analytics™ stock selection-scoring model. Using proprietary data from Cash Flow Analytics, we create a score ranging from 0 to 7, based on seven signals capturing five broad categories of financial performance and position: cash flow, profitability, operating efficiency, financial leverage and valuation. We then analyze the historical performance of the score using stock price data between 1998 and 2005.

The results indicate that the Cash Flow Analytics™ model is effective in generating abnormal returns for small and mid-capitalization stocks (those with market caps up to approximately \$3 billion). The model is most effective in selecting small market capitalization stocks (those with market caps of up to approximately \$1.4 billion). For these small market capitalization firms we find that high score firms outperform a size-based benchmark up to 79.3% of the time with abnormal returns of up to 13.3% per year. Low score firms underperform a size benchmark 93.1% of the time with abnormal returns of up to 19.1% per annum. An examination of a zero investment strategy indicates that high score firms outperform low score firms by as much as 35.0% per year. Additional analyses show that abnormal returns are maintained even when controls are included for risk and stock-price momentum or when illiquid stocks are removed. Moreover, we find that model-based holding periods are at least three months in length and for 25% of the identified stocks, holding periods are six months or longer.

As part of our concluding comments, we provide summary data on the number of firms receiving Cash Flow Analytics™ Scores of 0 to 1 and 6 to 7, by market cap., on the Cash Flow Analytics LLC site as of December, 2006. The data is presented in Table 10 below.

*Table 10. Market Capitalization of Firms with Cash Flow Analytics™ Scores of 0 to 1 and 6 to 7*

Market Cap	Number of Firms	
	Score 0-1	Score 6-7
Under \$100 million	181	211
\$100 million - \$250 million	95	54
\$250 million - \$500 million	76	66
\$500 million - \$1 billion	69	56
\$1 billion - \$1.5 billion	43	27
Total Firms \$1.5 billion and under	464	414
\$1.5 billion - \$3 billion	55	64
Total Firms \$3 billion and under	519	478

This table shows the number of firms rated a Cash Flow Analytics™ Score of 0 to 1 and 6 to 7, by market cap, as of December, 2006.

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