Which free cash flow is value relevant? The case of the energy industry

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ABSTRACT

The objective of this study is to empirically identify which accounting definition of free cash flow (FCF) is the most value relevant for the energy industry. This study aims to provide two contributions to the literature: First, the results would help retail investors make better decisions and, second, the results may encourage the Financial Accounting Standards Board (FASB) to require energy companies to use a specific definition of FCF. Using correlations and multiple regression analysis on a sample of 5,954 observations covering the 23-year period from 1988 to 2010, the study empirically shows that the FCF that has the most significant association with stock price changes, after controlling for many factors that may affect stock prices, is the one defined as cash flow from operations less capital expenditures less cash outflow for preferred stock dividends. It is recommended that the FASB require energy companies to disclose that FCF in the body of the Statement of Cash Flows or at its bottom together with the cash outflow for income taxes and interest expense. Short of that, the FASB should at least require energy companies that voluntarily disclose FCF to use only the FCF definition identified by this study.

Keywords: Free Cash Flow Definition, Value Relevant, Stock Prices, Energy Industry, Retail Investors.

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INTRODUCTION

While the finance literature may have a somewhat uniform definition of free cash flow (FCF), as the literature review below indicates, the accounting literature has a wide variety of definitions of FCF. The objective of this paper is to empirically identify which accounting definition of FCF has the highest information content, or the most value relevant. This study aims to provide two contributions to the literature. First, it identifies a specific definition of FCF that is the most relevant to accounting information users in terms of predicting future changes in stock price as this would help retail investors make better decisions. The study focuses the attention on retail investors as opposed to other users of financial statements such as institutional investors or bank lenders because retail investors, on average, are less sophisticated uses of financial statements and may be more easily confused by the different definitions of FCF used by various companies within the energy sector. Prior research finds that, as of 2005, 57 million U.S. households owned stock and that retail investors owned 26% of all equities (Harris 2010). Since the major objective of financial reporting is to provide information that is useful for decision-making, the first contribution of this study is to enhance the objective of accounting. Second, the results of this study may have major implications for financial accounting standard setters. While the Financial Accounting Standards Board (FASB) requires companies, in Statement of Financial Accounting Standard (SFAS) No. 95, to report Cash Flow from Operations (CFO) on the Statement of Cash Flows (SCF), it has so far discouraged companies from reporting CFO per share. The FASB is concerned that requiring, or even encouraging, companies to report CFO per share may be construed by some that it is moving away from accrual-basis accounting toward cash-basis accounting. Thus, it requires companies to report Earnings Per Share (EPS), which is based on accrual accounting, on the face of the Income Statement (I/S) but discourages companies from reporting CFO per share on the face of the SCF or anywhere else in the annual report. The results of this study might encourage the FASB to require companies to report a specific definition of FCF (but not FCF per share) in the body of the SCF or in the supplementary disclosures at the bottom of the SCF, together with cash paid for income taxes and cash paid for interest expense. This requirement would prohibit companies from voluntarily disclosing FCF of whatever definition they prefer. Adhikari and Duru 2006 report that companies that voluntarily disclose FCF information use a wide variety of definitions of FCF (apparently, each company is using the definition that shows the highest amount of FCF) and these companies, on average, are less profitable and more leveraged than other firms in their own industries. Having companies report FCF that is calculated in the same way would enhance comparability of accounting information across firms. Because companies in a specific industry may spend more cash for capital expenditure or other investing activities than companies in a different industry, the study focuses on the investigation of one industry, energy. Comparability in one specific industry is one of the enhancing qualitative characteristics of useful financial information as stated in FASB's SFAC No. 8. The remaining sections of the paper cover the literature review, the proposed model, sample, statistical results, conclusions, and limitations of the study, respectively. The final section provides some suggestions for further research.

LITERATURE REVIEW

In the finance literature, there is no wide variation of FCF definitions. Jensen 1986 is regarded as the seminal paper that laid out the basic definition of FCF. Jensen 1986 hypothesizes

that FCF increases agency costs because the managers of companies with high FCF spend it on acquiring negative net present value (NPV) projects for the purpose of satisfying their ego (being managers of large-size companies) and possibly for increasing their own compensation. He proves his hypothesis by showing that, after acquisition, the return on investment of acquirers is lower than before the acquisition. In light of that, he defines FCF as "cash flow in excess of that required to fund all projects that have positive net present value when discounted at the relevant cost of capital." He argues that managers should not acquire negative NPV projects and should instead distribute the FCF as dividends to the stockholders. If managers want to acquire new companies they should do so using borrowed capital rather the FCF. In this way, creditors would discipline managers (because they have the power to force the company into bankruptcy) and pressure them not to invest in negative NPV projects. The majority of papers in the finance literature tend to agree with Jensen's hypothesis. See, for example, (Mann and Sicherman 1991), (Opler and Sheridan 1993), (Dhumale 1998), (Carroll and Griffith 2001), and (Freund et al. 2003). The problem with Jensen's definition of FCF is that it is not publicly available and, thus, unobservable. Companies do not disclose the actual set of positive NPV projects that they have at any point in time or even for a given year. Thus, (Lang et al. 1991) used a measure of Tobin's q (the ratio of market to book value of equity) to proxy for this. The assumption is that if average q is less than 1, the marginal investment opportunity is negative. Lang et al. (1991, 317) note that the FCF hypothesis implies that the acquirer's return should be negatively related to FCF in low q firms, and unrelated to FCF in high q firms. They find that high q bidders have significantly higher mean returns than low q bidders, and higher median returns. As predicted by the FCF hypothesis, their low q, high FCF firms are the worst performers of any of their sample sub-sets. One notable exception to Jensen's FCF hypothesis is (Gregory 2005) who used a dataset of UK take-overs and proxies for FCF similar to those used by (Lang et al. 1991). Gregory reported that, contrary to Jensen's FCF hypothesis, there is evidence that acquirers with high FCF perform better than acquirers with low FCF.

Unlike the finance literature, the accounting literature has many definitions of FCF. FCF is defined differently between various academic articles, textbooks, professional articles, and the popular press. The definition of FCF also differs between companies and, furthermore, some companies change their definition of FCF over time. For example, Mandalay Resort (formerly known as Circus Circus) was one of the first companies to report FCF information in its 1988 annual report. Over the years, it has changed its FCF definition. In 1988 it defined it as Operating Income (OI), but in 2000, it added back pre-opening expenses, abandonment loss, depreciation and amortization (D&A), interest, dividend, and other income, as well as proceeds from disposal of equipment and other assets. Prior to 1999, Coca-Cola defined FCF as CFO less Cash Flow for Investing activities (CFI). In 1999, it changed the definition to CFO less "business investment." An analysis of its 1999's SCF indicates that by "business investment" Coca-Cola meant "acquisitions and investments." That change in definition increased its FCF in 1999 by almost $2 billion. Mills et al. 2002 report the following different definitions of FCF by popular magazines and investment advisory service organizations:

> **Money Magazine**: OI – Capital Expenditures (CE) – Changes in Working Capital (W/C).
> **Forbes Magazine**: Net Income (NI) + D&A + or – W/C adjustments – maintenance CE.
> **Harry Domasb's Winning Investing**: CFO – Cash paid for Property, Plant & Equipment (PPE) – Dividends.

The Motley Fool: NI + D&A – changes in W/C + or – cash outlay for taxes.
Value Line: NI + Depreciation – Dividends – CE – required debt repayments – any other scheduled cash outlays.
InvestorLinks: NI + D& – CE – Dividends.
Advisors Inner Circle Fund: NI + D&A – CE.

Subramanyam & Wild (2009, p. 417) define FCF as CFO less Capital Expenditures required to Maintain Productive Capacity (CEMPC) less total Dividends. In the same edition they mention another definition: FCF = NOPAT (Net Operating Profits After Tax) – Increase in NOA (Net Operating Assets). Kieso et al. (2012, p. 234) defines FCF as CFO – CE – Total Dividends.

The authors searched for "free cash flow definition" on Google search engine. This produced about 1.35 million entries for this title, the first of which is "Definitions of Free Cash Flow on the Web." Table 1 presents the 15 definitions under this title, together with the web address associated with each definition. It is interesting to note that every one of the 15 definitions is different from the others. Adhikari and Duru (2006) report that of 548 firms of their sample that voluntarily reported FCF information, 283 (or 51.6%) defined FCF as CFO – CE, 117 (or 21.4%) defined FCF as CFO – CE – Dividends, and 64 (or 11.7%) defined FCF as CFO – CFI. The remaining 84 firms (or 15.3%) defined FCF in four different other ways.

The above review of the literature, especially the accounting literature, indicates that FCF is defined in so many different ways. The objective of this study is to determine which one of these definitions is most correlated with (and, thus, is hypothesized to be the best predictor of) stock price changes. The following section describes the proposed model to be used to answer the research question of this study.

PROPOSED MODEL

The authors argue that FCF should be defined not only as the cash flow that is *cost free* (i.e., that is generated internally from operating activities) but also "the cash flow that management is *free* to do whatever it wants with it as long as management actions may not lead to the firm getting out of business". Actions that may lead to the firm getting out of business include (a) not maintaining existing operating capacity (i.e. not replacing worn out PPE) and (b) not paying the annual installment of mandatorily redeemable preferred stock or the annual dividend on preferred stock. Not maintaining the existing operating capacity will lead to the gradual liquidation of the firm until it eventually gets out of business. Not paying the annual installment of mandatorily redeemable preferred stock or the annual dividend on preferred stock will not lead to gradual liquidation of the firm but will amount to financial suicide. Creditors and investors may deal with the company only if they are paid exuberantly high returns (which would be prohibitively high cost for the firm) or may stop dealing with the firm altogether if they determine that their downside risk is becoming too great compared to their upside reward. It may also be argued that not paying the debt that becomes currently due may lead to the firm getting out of business because it will lead creditors to force the firm into bankruptcy. However, most firms have lines of credit or refinancing programs so the debt that becomes currently due is paid out from new borrowing that occurs in the current period. Thus, there is no need to pay the debt that becomes currently due this period out of internally generated cash flow from operating activities in the current period. The annual installment due and preferred stock dividend on

mandatorily redeemable preferred stock are not available in the Compustat database. They can only be obtained from a review of the notes to the financial statements. Considering the large size of the study sample (about 5,954 observations) that would be cost and time prohibitive. In addition, many companies do not have mandatorily redeemable preferred stock and many of those that do usually do not disclose the information in the footnotes based on the GAAP loophole that management believes the information is not material. To substitute for that information, the authors decided to subtract preferred stock dividends (PSD) from CFO in the determination of FCF. While regular preferred stock are not exactly similar to mandatory redeemable preferred stock (since dividend declaration and payment on regular preferred stock is discretionary), the nonpayment of PSD may give the same signal to creditors and investors as the nonpayment of mandatorily redeemable preferred stock dividends. Furthermore, the subtraction of total PSD from CFO in the determination of FCF may compensate to some degree for the non-subtraction of debt that becomes currently due this period.

In light of the above discussion, the authors hypothesize that FCF should be defined as follows:

FCF = CFO – CEMPC – PSD

Where:

FCF = Free Cash Flow

CFO = Cash Flow from Operating activities

CEMPC = Capital Expenditure required to Maintain Productive Capacity

PSD = Preferred Stock Dividends

The authors decided to use the current year Depreciation & Amortization expense (D & A) as a proxy for CEMPC. A better proxy for that would be D & A computed based on the current cost of property, plant & equipment (PPE). However, the disclosure of current cost of PPE, which was required under SFAS 34, is no longer mandatory, and few companies, if any, provide that disclosure.

Since the objective of this empirical study is to determine which FCF is a better predictor of stock prices, the study model will include other definitions of FCF besides the definition hypothesized here. Since there are so many definitions of FCF as illustrated in the literature review, the authors decided to include in the model only those definitions that are most common. The following nine definitions will be included in the model:

FCF1 = CFO - CEMPC

FCF2 = CFO - CE

FCF3 = CFO - CFI

FCF4 = CFO - CEMPC - PSD

FCF5 = CFO - CE - PSD

FCF6 = CFO - CFI – PSD

FCF7 = CFO – CEMPC - TD

FCF8 = CFO – CE – TD

FCF9 = CFO – CFI - TD

Where: TD = Total Dividends paid on common and preferred stock.

It should be noted that FCF4 is our hypothesized definition, and FCF8 is Standard & Poors' definition and is reported directly in its COMPUSTAT database.

Since the change in the stock price per share (ΔSPPS) may be affected by changes in sales per share (ΔSPS), earnings per share (ΔEPS), dividend per share (ΔDPS), and book value per share (ΔBVPS), the proposed model includes all these variables so they can be controlled for

to show the effect of change in FCF per share (ΔFCFPS) on ΔSPPS. Also, to control for the size of the firm, the natural logarithm of total sales (lnTS) and natural logarithm of total assets (lnTA) will be included in the model as well. The authors also include year indicators to control for time fixed effects. Thus, the proposed model is as follows:

$$\Delta SPPS = B_0 + B_1\Delta SPS + B_2\Delta EPS + B_3\Delta DPS + B_4\Delta BVPS + B_5\Delta FCFPS_{1\text{-}9} + B_6 lnTS + B_7 lnTA + € \quad (1)$$

The definitions of the model variables are provided in Appendix A.

$\Delta FCFPS = FCFPS_t - FCFPS_{t-1}$ where $FCFPS1_t$ = FCF1/weighted average number of common shares outstanding during year t. This weighted average number of common shares will be computed by dividing NI by EPS for year t. The same rule applies for FCFPS2 through FCFPS9.

THE STUDY SAMPLE

The study sample includes all energy companies listed in COMPUSTAT for the 23-year period 1988 to 2010. After eliminating all firm year observations that have missing variables, the final sample is composed of 5,954 observations. The study period starts from 1988 because SFAS 95, which requires companies to disclose CFO, was issued in 1987. Because the model uses the changes from year to year, 1988 observations will represent the changes from 1987 to 1988 data. The study period ends in 2010 because this is the last year with available data on COMPUSTAT at the time of collection. The year 2008 was a very abnormal year as total market indexes took a big dive because of the world's financial crisis that started during that year. In that year, the Dow Jones Industrial average lost 31 percent of its value (but at one point, in November of that year, it was down 39 percent). The NASDAQ index lost 39 percent (but in November 2008 it was down 46 percent). Similarly, the S&P 500 Cash Index lost 36 percent (but in November 2008 it was down 43 percent). Because of that abnormality, the authors thought that the change in stock prices during 1988 was affected by psychological factors much more so than by financial factors. As a result, the authors ran the model using a sample of observations ending in 2007. The results were not significantly different from the results based on the study sample ending in 2010.

STATISTICAL RESULTS

TABLE 2 presents Pearson correlation coefficients for all the study and control variables. As the table indicates, with the exception that FCF3, FCF6 and FCF9 have negative associations, all FCF definitions have positive associations with changes in stock price (*Δspps*) at the 5% significance level. Among the control variables, *Δspps* is negatively associated with changes in dividends per share (*Δdps*), and changes in book value per share (*Δbvps*), and these associations are statistically significant at the 5% level. Furthermore, *Δsps*, *Δeps*, *Δdps*, and *Δbvps* are statistically significantly associated with all definitions of FCF (with one exception that *Δdps* is negatively associated with FCF7) whereas *lnsale* and *lnat* are not statistically significant with any of the FCF definition suggesting that these variables would be appropriate controls. The correlations presented in Table 2 already present some interesting results which are validated in a multi-variate framework shown in the next table.

TABLE 3 presents regression coefficients for nine models by including one FCF definition at a time in the model. Along with the control variables specified in Model (1), the authors also include year fixed effects. These fixed effects control for heterogeneity at the year

level that may not be captured by our set of controls. As TABLE 3 shows, with the exception that FCF3, FCF6, and FCF9 have negative associations with changes in stock price (*Δspps*), all FCF definitions have positive associations with *Δspps* at the 1% significance level after controlling for other determinants of changes in stock price. Among the control variables, *Δdps* and *Δbvps* are negatively associated and *Δeps* is positively associated with *Δspps* and these associations are statistically significant at the 1% level across all specifications of FCF.

Overall, TABLE 3 confirms the results of the univariate correlations in Table 2. It is interesting to note that the three definitions of FCF that have significant negative associations with changes in stock prices have one thing in common: they all include CFI as a deduction from CFO. That is the case whether CFI alone is deducted (FCF3), CFI and PSD are deducted (FCF6), or CFI and TD are deducted (FCF9). Apparently, PSD and TD have very negligible effect, if any, on stock price changes. This is also borne out by the fact that when CEMPC or total CE are deducted from CFO (FCF1 and FCF2 respectively) there are significant associations with stock price changes. This is the case whether PSD is also deducted (FCF4 and FCF5) or TD is also deducted (FCF7 and FCF8). Of the six FCF definitions that have significant associations with stock price changes, the three that have CE as a deduction from CFO (FCF2, FCF5 and FCF8) have the most significant associations. Of those latter three, FCF5 (CFO – CE –PSD) has a little bit more significant association with stock price changes than the other two. Furthermore, a look at the adjusted R-squared across all models indicates that the model which includes FCF5 is tied among the models with the highest adjusted R^2's among the models where the definition of FCF is positively correlated with future changes in stock price (Adjusted R-squared = 0.1523). This suggests that the model incorporating FCF5 is among the models with the highest explanatory power for changes in future stock price among the models where the definition of FCF is positively correlated with changes in future stock price.

CONCLUSIONS

In light of the statistical results above, the authors conclude that FCF5 (CFO – CE – PSD) is the most value-relevant definition of free cash flow for energy companies. While other definitions of free cash flow, including our hypothesized definition (FCF4), are also significantly associated with stock price changes, FCF5 was the one that had the most significant association when the authors control for year fixed effects and for total assets and total sales. The reason our hypothesized definition was not the most significantly associated with changes in stock prices could be due to the possibility that the un-inflation-adjusted depreciation and amortization expense does not really approximate capital expenditures required to maintain productive capacity. Another reason could be that the stock market participants do not make an effort to determine capital expenditures required to maintain productive capacity (and they just use the conveniently available "total capital expenditures") when they are making their investment decisions. In any event, the authors recommend that the standards setters, particularly the FASB, should require energy companies to disclose FCF5 definition (CFO – CE – PSD) in the body of the Statement of Cash Flows or at its bottom together with the cash outflow for income taxes and interest expense. Short of that, the FASB should at least require energy companies that voluntarily disclose FCF to use only the FCF definition identified by this study. Furthermore, if a company departs from this definition, the independent auditor should consider this departure as a violation of GAAP.

LIMITATIONS AND SUGGESTIONS FOR FURTHER RESEARCH

The study is subject to some limitations. The most important limitation is the possibility that the study model did not include other variables that may have influenced stock price changes and is correlated with our definitions of free cash flow. The combined effect of those other variables is represented by the error term $\sum$ in the model. Adding year fixed effects help mitigate some concerns but not all regarding unobservable explanatory variables. Another limitation is that there may be other formulas for free cash flow which may be more value-relevant than the ones included in this study. While the authors tried to develop as comprehensive a list as possible, other definitions of free cash flow may possibly exist.

One suggestion for further research is to replicate the study using other variables that could possibly have more effect on stock prices than the variables included in the study model. Another suggestion would be to investigate whether a trading strategy could be developed buying (shorting) stock of firms which have the greatest positive (negative) change in one or more measures of FCF over the prior year.

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APPENDIX A

Variable Definitions

Δspps	Change in stock price between the end of the next fiscal year and the current year.
Δfcfps1	Change in the difference between cash flow from operations (CFO) and depreciation and amortization expense (DP) over the current fiscal year.
Δfcfps2	Change in the difference between cash flow from operations (CFO) and capital expenditures (CE) over the current fiscal year.
Δfcfps3	Change in the difference between cash flow from operations (CFO) and cash flow from investing activities (CFI) over the current fiscal year.
Δfcfps4	Change in cash flow from operations (CFO) minus depreciation and amortization expense (DP) minus preferred stock dividends (PSD) over the current fiscal year.
Δfcfps5	Change in cash flow from operations (CFO) minus capital expenditures (CE) minus preferred stock dividends (PSD) over the current fiscal year.
Δfcfps6	Change in cash flow from operations (CFO) minus cash flow from investing activities (CFI) minus preferred stock dividends (PSD) over the current fiscal year.
Δfcfps7	Change in cash flow from operations (CFO) minus depreciation and amortization expense (DP) minus total dividends (TD) over the current fiscal year.
Δfcfps8	Change in cash flow from operations (CFO) minus capital expenditures (CE) minus total dividends (TD) over the current fiscal year.
Δfcfps9	Change in cash flow from operations (CFO) minus cash flow from investing activities (CFI) minus total dividends (TD) over the current fiscal year.
Δsps	Change in total sales per share over the current fiscal year.
Δeps	Change in earnings per share over the current fiscal year.
Δdps	Change in dividends per share over the current fiscal year.

Δbvps	Change in book value per share over the current fiscal year.
lnsale	Natural logarithm of total sales over the current fiscal year.
Lnat	Natural logarithm of total assets at the current fiscal year end.

TABLE 1

Definitions of Free Cash Flow on the Web

1. In corporate finance, free cash flow (FCF) is cash flow available for distribution among all the securities holders of an organization. They include equity holders, debt holders, preferred stock holders, convertible security holders, and so on.
   en.wikipedia.org/wiki/Free_cash_flow
2. Net income plus depreciation and amortization, less changes in working capital, less capital expenditure
   en.wiktionary.org/wiki/free_cash_flow
3. Adjusted operating cash flow less interest and tax paid, prior to distributions to shareholders. This is the cash flow available for payments of dividends and share buybacks as well as repayments of capital on loans.
   www.reed-lsevier.com/investorcentre/glossary/Pages/Home.aspx
4. Cash flow from operating activities, investments, financial items and tax and the effect of restructuring measures on cash flow.
   www.investor.rezidor.com/phoenix.zhtml
5. equals EBITDA minus net interest expense, capital expenditures, change in working capital, taxes paid, and other cash items (net other expenses less proceeds from the disposal of obsolete and/or substantially depleted operating fixed assets that are no longer in operation).
   www.cemex.com/ic/ic_glossary.asp
6. This item on the cash flow statement represents the sum of cash flows generated by operating and investing activities.
   investors.benettongroup.com/phoenix.zhtml
7. How much money a company could pay shareholders out of profits without expanding, but without running down its existing operations either.... ...
   moneyterms.co.uk/d/
8. Represents a common measure of internally generated cash and is defined as cash from operations less fixed asset purchases.
   portal.acs.org/portal/PublicWebSite/about/aboutacs/financial/WPCP_012234
9. Cash available after financing operations and investments, available to pay down debt.
   www.graduates.bnpparibas.com/glossary.html
10. A stock analyst's term with a definition that varies somewhat depending on the particular analyst. It usually approximates operating cash flow minus necessary capital expenditures. ...
    www.jackadamo.com/glossary.htm
11. The amount of money that a business has at its disposal at any given time after paying out operating costs, interest payments on bank loans and bonds, salaries, research and

development and other fixed costs.
www.premierfoods.co.uk/investors/shareholder- services/Glossary.cfm

12. Net Operating Profit After Tax minus Year-to-Year change in Net Capital.
www.intrinsicvalue.com/glossary.htm
13. The increase in cash from one period to the next.
www.knowledgedynamics.com/demos/BreakevenFlash/GlossaryMain.htm
14. Cash flow after operating expenses; a good indicator of profit levels.
healthcarefinancials.wordpress.com/2008/01/24/equity-based-securities-terms-and-definitions-for-physicians/
15. The surplus cash generated from operating activities recognized in the profit and loss account. This expresses a company's internal financing power, which can be used for investments, the repayment of debt, dividend payments and to meet funding requirements.
www.deutsche-euroshop.de/berichte/gb2004/glossar_e.php

TABLE 2

Pearson Correlation Coefficients

	Δspps	Δfcfps1	Δfcfps2	Δfcfps3	Δfcfps4	Δfcfps5	Δfcfps6	Δfcfps7	Δfcfps8	Δfcfps9	Δsps	Δeps	Δdps	Δbvps	lnsale	lnat
Δspps	1.00															
Δfcfps1	**0.03**	1.00														
Δfcfps2	**0.06**	**0.91**	1.00													
Δfcfps3	**-0.15**	**0.63**	**0.42**	1.00												
Δfcfps4	**0.03**	**1.00**	**0.91**	**0.63**	1.00											
Δfcfps5	**0.06**	**0.91**	**1.00**	**0.42**	**0.91**	1.00										
Δfcfps6	**-0.15**	**0.63**	**0.42**	**1.00**	**0.63**	**0.42**	1.00									
Δfcfps7	**0.05**	**0.81**	**0.64**	**0.39**	**0.81**	**0.64**	**0.39**	1.00								
Δfcfps8	**0.08**	**0.85**	**0.90**	**0.24**	**0.85**	**0.90**	**0.24**	**0.84**	1.00							
Δfcfps9	**-0.14**	**0.48**	**0.19**	**0.91**	**0.48**	**0.19**	**0.91**	**0.49**	**0.18**	1.00						
Δsps	0.00	**0.69**	**0.67**	**0.58**	**0.69**	**0.67**	**0.58**	**0.43**	**0.52**	**0.40**	1.00					
Δeps	0.00	**0.75**	**0.76**	**0.22**	**0.75**	**0.76**	**0.22**	**0.72**	**0.81**	**0.15**	**0.56**	1.00				
Δdps	**-0.06**	**0.51**	**0.61**	**0.50**	**0.51**	**0.61**	**0.50**	**-0.08**	**0.21**	**0.10**	**0.56**	**0.22**	1.00			
Δbvps	**-0.08**	**0.33**	**0.23**	**0.22**	**0.33**	**0.23**	**0.22**	**0.58**	**0.44**	**0.40**	**0.37**	**0.59**	**-0.30**	1.00		
lnsale	0.01	0.01	0.01	0.00	0.01	0.01	0.00	-0.01	0.00	-0.02	**0.02**	0.01	**0.03**	-0.01	1.00	
lnat	0.01	0.01	0.01	0.00	0.01	0.01	0.00	-0.01	-0.01	-0.02	0.02	0.01	**0.03**	-0.01	**0.94**	1.00

Variables are defined in Appendix A. Numbers in bold indicate significance at the 5% level.

TABLE 3

Association between Various Measures of Free-Cash-Flow and Changes in Stock Prices

Variables	Predicted Sign	Δspps (1)	Δspps (2)	Δspps (3)	Δspps (4)	Δspps (5)	Δspps (6)	Δspps (7)	Δspps (8)	Δspps (9)
Δfcfps1	+	0.266*** (3.2)								
Δfcfps2	+		0.172*** (3.29)							
Δfcfps3	+			-0.236*** (-8.87)						
Δfcfps4	+				0.272*** (3.25)					
Δfcfps5	+					0.173*** (3.3)				
Δfcfps6	+						-0.237*** (-8.89)			
Δfcfps7	+							0.266*** (3.2)		
Δfcfps8	+								0.172*** (3.29)	
Δfcfps9	+									-0.236*** (-8.87)
Δsps		0.008 (0.38)	0.013 (0.62)	0.034 (1.6)	0.008 (0.38)	0.013 (0.63)	0.033 (1.58)	0.008 (0.38)	0.013 (0.62)	0.034 (1.6)
Δeps		0.189*** (2.94)	0.182*** (2.82)	0.149** (2.36)	0.179*** (2.75)	0.176*** (2.71)	0.156** (2.48)	0.189*** (2.94)	0.182*** (2.82)	0.149** (2.36)
Δdps		-0.936*** (-5.83)	-0.937*** (-5.83)	-0.857*** (-5.38)	-0.925*** (-5.77)	-0.93*** (-5.79)	-0.867*** (-5.44)	-0.67*** (-3.82)	-0.764*** (-4.62)	-1.093*** (-6.8)
Δbvps		-0.31*** (-6.44)	-0.295*** (-6.08)	-0.187*** (-3.75)	-0.313*** (-6.51)	-0.297*** (-6.13)	-0.184*** (-3.68)	-0.31*** (-6.44)	-0.295*** (-6.08)	-0.187*** (-3.75)
Lnsale		0.112 (0.76)	0.097 (0.66)	0.078 (0.53)	0.112 (0.76)	0.097 (0.66)	0.078 (0.53)	0.112 (0.76)	0.097 (0.66)	0.078 (0.53)
Lnat		0.001 (0.01)	0.027 (0.15)	0.06 (0.34)	0.002 (0.01)	0.028 (0.15)	0.06 (0.33)	0.001 (0.01)	0.027 (0.15)	0.06 (0.34)

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Intercept	-1.354 (-1.63)	-1.4* (-1.69)	-1.603* (-1.94)	-1.358 (-1.63)	-1.404* (-1.69)	-1.599* (-1.94)	-1.354 (-1.63)	-1.4* (-1.69)	-1.603* (-1.94)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,954	5,954	5,954	5,954	5,954	5,954	5,954	5,954	5,954
Adjusted R^2	0.1522	0.1523	0.1618	0.1522	0.1523	0.1619	0.1522	0.1523	0.1618

This table provides the results of regressing the change in future stock prices of a firm (Δspps) on various measures of changes in free cash flow (Δfcfps1 - Δfcfps9) and control variables. Coefficients are provided with t-statistics in parentheses below. Variables are defined in Appendix A. ***, **, and * represent two-tailed p-value significance levels of 0.01, 0.05, and 0.1 respectively.