

Which Free Cash Flow Is Value Relevant? An Empirical Investigation

Mostafa M. Maksy
Kutztown University of Pennsylvania

Gary T. Chen
University of Illinois at Chicago

This study attempts to identify which definition of free cash flow (FCF) is the most value relevant. The results would help retail investors make better decisions, and may encourage accounting standards setters to require companies to use a specific definition of FCF to enhance comparability. Using a sample of 115,940 observations covering the period 1988 to 2010, the study empirically shows that the FCF that has the most significant association with stock price changes is the one defined as cash flow from operations less net cash outflow for investing activities less cash outflow for preferred stock dividends.

INTRODUCTION

While the finance literature may have a somewhat generally accepted 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 study 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 attempts to identify a specific definition of FCF that is most relevant to accounting information users in terms of predicting future changes in stock prices 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 users of financial statements and may be more easily confused by the different definitions of FCF used by various companies. 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, such as the Financial Accounting Standards Board (FASB) and the International Accounting Standards Board (IASB). While the FASB, in Statement of Financial Accounting Standard (SFAS) No. 95, and the IASB, in International Accounting Standard (IAS) No. 7, require companies to report Cash Flow from Operations (CFO) on the Statement of Cash Flows (SCF), they have so far discouraged companies from reporting CFO per share. The FASB and the IASB are concerned that requiring, or even encouraging, companies to report CFO per share may be construed by some that they are moving away from accrual-basis accounting toward cash-basis accounting. Thus, they require companies to report Earnings Per Share (EPS), which is based on accrual

accounting, on the face of the Income Statement (I/S) but discourage 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 accounting standard setters (e.g., the FASB and IASB) 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. SFAS No. 95 already requires companies to disclose cash paid for income taxes and for interest expense at the bottom of the SCF. Perhaps, the FASB would require companies to disclose FCF together with these two items. 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. Comparability 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 than 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, e.g., Mann and Sicherman (1991), Opler and Titman (1993), Dhumale (1998), Carroll and Griffith (2001), and Freund, Prezas, and Vasudevan (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, Stulz, and Walking (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) 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 (2005) 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 from academic article to academic article, textbook to textbook, professional article to professional article, from company to company (and some companies change their definition of FCF from time to time), and from all these to the popular press. 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, Bible, and Mason (2002) report the following different definitions of FCF by popular magazines and investment advisory service organizations:

Money Magazine: $OI - \text{Capital Expenditures (CE)} - \text{Changes in Working Capital (W/C)}$.

Forbes Magazine: $\text{Net Income (NI)} + \text{D\&A} + \text{or} - \text{W/C adjustments} - \text{maintenance CE}$.

Harry Domasb’s Winning Investing: $\text{CFO} - \text{Cash paid for Property, Plant \& Equipment (PPE)} - \text{Dividends}$.

The Motley Fool: $\text{NI} + \text{D\&A} - \text{changes in W/C} + \text{or} - \text{cash outlay for taxes}$.

Value Line: $\text{NI} + \text{Depreciation} - \text{Dividends} - \text{CE} - \text{required debt repayments} - \text{any other scheduled cash outlays}$.

InvestorLinks: $\text{NI} + \text{D\&A} - \text{CE} - \text{Dividends}$.

Advisors Inner Circle Fund: $\text{NI} + \text{D\&A} - \text{CE}$.

Subramanyam & Wild (2009, p. 417) define FCF as CFO less Capital Expenditures required to Maintain Productive Capacity (CEMPC) less Total Dividends (TD). In the same edition, they mention another definition: $\text{FCF} = \text{Net Operating Profits After Tax (NOPAT)} - \text{Increase in Net Operating Assets (NOA)}$. Kieso, Weygandt, and Warfield (2013, p. 234) defines FCF as $\text{CFO} - \text{CE} - \text{TD}$.

Searches for “free cash flow definition”, on Google search engine, produced about 3.46 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 the 548 firms of their sample that voluntarily reported FCF information, 283 (51.6%) defined FCF as $\text{CFO} - \text{CE}$, 117 (21.4%) defined FCF as $\text{CFO} - \text{CE} - \text{Dividends}$, and 64 (11.7%) defined FCF as $\text{CFO} - \text{CFI}$. The remaining 84 firms (15.3%) defined FCF in four different other ways.

Penman and Yehuda (2009), using a definition of FCF as CFO less cash investments, find that a dollar more of FCF is, on average, associated with approximately a dollar less in the market value of the business. They also find that this definition of FCF has no association with changes in the market value of the equity. Furthermore, controlling for the cash investment component of FCF, they find that CFO also reduces the market value of the business dollar-for-dollar and is unrelated to the changes in market value of the equity. GuruFocus.com, a website that tracks market insights and news of investment gurus, published two research studies (Gurufocus 2013a and 2013b) concluding that earnings and book values are significantly correlated with stock prices but FCF, defined as $\text{CFO} - \text{CE}$ and acquisitions, is not.

On the other hand, Habib (2011) show that firms with greater growth opportunities and free cash flow, defined as the difference between CFO and CE, will have a higher value price and, additionally, FCF is positively related to stock return. Similarly, Shahmoradi (2013), using the same definition of FCF and a sample of listed companies in Tehran Stock Exchange between 2002 and 2011, reports a relationship (significant at the .05 level) between FCF and stock return of firms.

The above review of the literature, especially the accounting literature, indicates that FCF is defined in many different ways. The objective of this study is to determine which one of these definitions, if any, 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 may lead to future difficulties in obtaining financing through the equity markets. 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 can also be argued that not paying the debt that becomes currently due may lead the firm to bankruptcy because risk-averse creditors may force the firm to liquidate in order to recuperate their costs. 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 115,940 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 estimate CEMPC as the inflation-adjusted depreciation and amortization expense (D&A) for the current year. However, because of the large size of the sample and the variety of industries included there in, there is no inflation index that can be used to adjust D&A for all the companies in the sample. The authors tried to use the general consumer price index (CPI) for this purpose but found out that the mean inflation-adjusted D&A for the sample is actually greater than the mean for total CE for the current year. That indicates that the general CPI is not appropriate because its use would mean that, on average, the companies in the sample not only are not expanding, but they are not even maintaining their existing productive capacity. Consequently, the authors decided to use the current year unadjusted D&A as a proxy for CEMPC.

However, 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 statistical analyses only those definitions that are most common. The following nine definitions will be included:

$$\begin{aligned}
\text{FCF1} &= \text{CFO} - \text{CEMPC} \\
\text{FCF2} &= \text{CFO} - \text{CE} \\
\text{FCF3} &= \text{CFO} - \text{CFI} \\
\text{FCF4} &= \text{CFO} - \text{CEMPC} - \text{PSD} \\
\text{FCF5} &= \text{CFO} - \text{CE} - \text{PSD} \\
\text{FCF6} &= \text{CFO} - \text{CFI} - \text{PSD} \\
\text{FCF7} &= \text{CFO} - \text{CEMPC} - \text{TD} \\
\text{FCF8} &= \text{CFO} - \text{CE} - \text{TD} \\
\text{FCF9} &= \text{CFO} - \text{CFI} - \text{TD}
\end{aligned}$$

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 ($\ln\text{TS}$) and natural logarithm of total assets ($\ln\text{TA}$) will be included in the model as well. Because stock price changes may vary from industry to industry, the authors include in the model dummy variables to control for the industry fixed effects. The authors use Fama-French industry classifications. The authors also control for year-end fixed effects. Thus, the proposed model is as follows:

$$\begin{aligned}
\Delta\text{SPPS} = & B_0 + B_1\Delta\text{SPS} + B_2\Delta\text{EPS} + B_3\Delta\text{DPS} + B_4\Delta\text{BVPS} + B_5\Delta\text{FCFPS}_{1-9} + B_6\ln\text{TS} + B_7\ln\text{TA} \\
& + B_8 \text{IND}_{1-44} + \epsilon
\end{aligned} \tag{1}$$

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

$\Delta\text{FCFPS} = \text{FCFPS}_t - \text{FCFPS}_{t-1}$ where $\text{FCFPS}_{1t} = \text{FCF1}/\text{weighted average number of common shares outstanding during year } t$. 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 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 115,940 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, observations from the year 1988 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, all FCF definitions, except for FCF2, FCF5 and FCF8, have positive associations with changes in stock price (Δsps) at the 5% significance level. Among the control variables, Δsps is positively associated with changes in total sales per share (Δsps), changes in earnings per share (Δeps), changes in book value per share ($\Delta bvps$), natural logarithm of total sales ($lnsale$), and natural logarithm of total assets ($lnat$) and these associations are statistically significant at the 5% level. Furthermore, Δsps , Δeps , and Δdps are statistically significantly associated with all definitions of FCF whereas $lnsale$ and $lnat$ are statistically significant with some of the FCF specifications suggesting that these variables would be appropriate controls. The correlations presented in Table 2 already present some interesting results which the authors validate 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 and industry fixed effects. Industry categories are based on the Fama-French (1997) 48-industry classification scheme. These fixed effects control for heterogeneity at the industry and year level that may not be captured by our set of controls (such as the high tech industry boom of the 1990s or the recent financial crisis of 2008). As the table shows, all FCF definitions, except for FCF2, FCF5 and FCF8, have positive associations with changes in stock price (Δsps) at the 1% significance level after controlling for other determinants of changes in stock price. Among the control variables, Δsps is negatively associated with changes in stock price and is statistically significant at the 1% level across all specifications of FCF. Δeps and $\Delta bvps$ are both positively associated with Δsps and statistically significant at the 10% level or better in all models.

Overall, Table 3 confirms the results of the univariate correlations in Table 2. It is interesting to note that FCF8, which is Standard & Poor's definition of free cash flow, does not have any significant association with changes in stock prices. All three definitions of FCF that do not have any significant associations with changes in stock prices have one thing in common: they all include capital expenditures (CE) as a deduction from CFO. That is the case whether CE alone is deducted (FCF2), CE and preferred stock dividends (PSD) are deducted (FCF5), or CE and total dividends (TD) are deducted (FCF8). 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 (capital expenditure required to maintain productive capacity) or CFI (cash flow from investing activities) are deducted from CFO (FCF1 and FCF3 respectively) there are significant associations with stock price changes. This is the case whether PSD is also deducted (FCF4 and FCF6) or TD is also deducted (FCF7 and FCF9). Of the six FCF definitions that have significant associations with stock price changes, the three that have CFI as a deduction from CFO (FCF3, FCF6 and FCF9) have the most significant associations. Of those latter three, FCF6 (CFO – CFI – PSD) has a little bit more significant association with stock price changes than the other two.

CONCLUSIONS

In light of the statistical results above, the authors conclude that FCF6 is the most value-relevant definition of free cash flow. While the authors' hypothesized definition of free cash flow (FCF4) was significantly associated with stock price changes, it was not the one that had the most association. This 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 when they are making their investment decisions. In any event, the authors recommend that the standards setters, particularly the FASB and IASB, should require companies to disclose that FCF in the body of the SCF or at its bottom together with the cash outflow for income taxes and interest expense. Short of that, the standard setters should at least require 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 and industry 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 for 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

$\Delta spps$	Change in stock price between the end of the next fiscal year and the current year.
$\Delta fcfps1$	Change in the difference between cash flow from operations (CFO) and depreciation and amortization expense (DP) over the current fiscal year.
$\Delta fcfps2$	Change in the difference between cash flow from operations (CFO) and capital expenditures (CE) over the current fiscal year.
$\Delta fcfps3$	Change in the difference between cash flow from operations (CFO) and cash flow from investing activities (CFI) over the current fiscal year.
$\Delta fcfps4$	Change in cash flow from operations (CFO) minus depreciation and amortization expense (DP) minus preferred stock dividends (PSD) over the current fiscal year.
$\Delta fcfps5$	Change in cash flow from operations (CFO) minus capital expenditures (CE) minus preferred stock dividends (PSD) over the current fiscal year.
$\Delta fcfps6$	Change in cash flow from operations (CFO) minus cash flow from investing activities (CFI) minus preferred stock dividends (PSD) over the current fiscal year.
$\Delta fcfps7$	Change in cash flow from operations (CFO) minus depreciation and amortization expense (DP) minus total dividends (TD) over the current fiscal year.
$\Delta fcfps8$	Change in cash flow from operations (CFO) minus capital expenditures (CE) minus total dividends (TD) over the current fiscal year.
$\Delta fcfps9$	Change in cash flow from operations (CFO) minus cash flow from investing activities (CFI) minus total dividends (TD) over the current fiscal year.
Δsps	changes 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.
$\Delta bvps$	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

	Δ spps	Δ fcfps1	Δ fcfps2	Δ fcfps3	Δ fcfps4	Δ fcfps5	Δ fcfps6	Δ fcfps7	Δ fcfps8	Δ fcfps9	Δ sps	Δ epps	Δ dps	Δ bvps	lnsale	lnat
Δ spps	1.00															
Δ fcfps1	0.01	1.00														
Δ fcfps2	0.00	0.94	1.00													
Δ fcfps3	0.07	0.73	0.56	1.00												
Δ fcfps4	0.01	1.00	0.94	0.73	1.00											
Δ fcfps5	0.00	0.94	1.00	0.56	0.94	1.00										
Δ fcfps6	0.07	0.73	0.56	1.00	0.73	0.56	1.00									
Δ fcfps7	0.01	0.96	0.92	0.64	0.96	0.92	0.64	1.00								
Δ fcfps8	0.00	0.88	0.95	0.46	0.88	0.95	0.46	0.94	1.00							
Δ fcfps9	0.07	0.73	0.57	1.00	0.73	0.57	1.00	0.67	0.49	1.00						
Δ sps	0.03	0.18	0.18	0.23	0.18	0.18	0.23	0.17	0.16	0.23	1.00					
Δ epps	0.03	0.39	0.37	0.39	0.39	0.37	0.39	0.30	0.27	0.37	0.30	1.00				
Δ dps	0.00	0.06	0.01	0.24	0.06	0.01	0.24	-0.21	-0.29	0.17	0.01	0.29	1.00			
Δ bvps	0.06	-0.24	-0.17	-0.27	-0.24	-0.17	-0.27	-0.20	-0.13	-0.26	0.05	0.14	-0.12	1.00		
lnsale	0.01	0.00	0.00	-0.01	0.00	0.00	-0.01	0.00	0.00	-0.01	0.01	0.00	0.00	0.02	1.00	
lnat	0.01	-0.01	0.00	-0.01	-0.01	0.00	-0.01	-0.01	0.00	-0.01	0.01	0.00	0.00	0.02	0.90	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	Δ spps	Δ spps	Δ spps	Δ spps	Δ spps	Δ spps	Δ spps	Δ spps	Δ spps
	Sign	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Δ fcfps1	+	0.066** *								
Δ fcfps2	+		0.006 (0.53)							
Δ fcfps3	+			0.16*** (47.13)						
Δ fcfps4	+				0.067** *					
Δ fcfps5	+					0.006 (0.54)				
Δ fcfps6	+						0.16*** (47.19)			
Δ fcfps7	+							0.066** *		
Δ fcfps8	+								0.006 (0.53)	
Δ fcfps9	+									0.16*** (47.13)
Δ sps	-	0.041**	0.028**	0.205**	0.041**	0.028**	0.205**	0.041**	0.028**	0.205**
Δ epps	-	0.057* (1.71)	0.059* (1.78)	0.572** *	0.056* (1.71)	0.059* (1.78)	0.573** *	0.057* (1.71)	0.059* (1.78)	0.572** *
Δ dpps	-	-0.047 (-0.29)	0.098 (0.61)	-0.088 (-0.55)	-0.048 (-0.29)	0.098 (0.6)	-0.087 (-0.55)	0.02 (0.12)	0.104 (0.65)	0.072 (0.45)
Δ bvpps	-	0.146** *	0.142** *	0.186** *	0.146** *	0.142** *	0.186** *	0.146** *	0.142** *	0.186** *
Lnsale		0.168 (0.26)	0.155 (0.24)	0.35 (0.55)	0.167 (0.26)	0.155 (0.24)	0.35 (0.55)	0.168 (0.26)	0.155 (0.24)	0.35 (0.55)

Lnat	0.279 (0.4)	0.29 (0.42)	0.134 (0.2)	0.28 (0.4)	0.29 (0.42)	0.134 (0.2)	0.279 (0.4)	0.29 (0.42)	0.134 (0.2)
Intercept	-3.452 (-0.17)	-2.164 (-0.11)	-12.129 (-0.62)	-3.46 (-0.17)	-2.167 (-0.11)	-12.14 (-0.62)	-3.452 (-0.17)	-2.164 (-0.11)	-12.129 (-0.62)
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	115,940	115,940	115,940	115,940	115,940	115,940	115,940	115,940	115,940
Adjusted R ²	0.0044	0.0040	0.0228	0.0044	0.0041	0.0228	0.0044	0.0041	0.0228

This table provides the results of regressing the change in future stock prices of a firm (Δ sp_{it}) on various measures of changes in free cash flow (Δ fcfs_{it} - Δ fcfs_{it-9}) 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.