On the Definition, Measurement, and Use of the Free Cash Flow Concept in Financial Reporting and Analysis: A Review and Recommendations

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The concept of free cash flow was first proposed by Jensen (1986) in the context of the agency problem; however he did not propose a specific calculation for free cash flow. Since then free cash flow has become a popular metric for academic researchers and financial statement users, but there is much variation in how free cash flow is being calculated. We highlight the variety of ways that free cash flow is calculated, discuss the problems associated with having such a wide variation, and make recommendations to address the issue.

INTRODUCTION

Cash flow is important to all individuals and organizations. For a business organization, the cash flow statement (CFS) is one of the four major financial statements included in its annual report. Many cash flow metrics are available and can be derived from this financial statement. A new cash flow term, called free cash flow (FCF) was first coined by Jensen (1986) in the context of agency conflict. He defined FCF as "cash flow in excess of that required to fund all projects that have positive net present values when discounted at the relevant cost of capital." According to Jensen "Conflict of interest between stockholders and managers' over payment policies are especially severe when the organization generates substantial free cash flow." He proposed the "Free Cash Flow Theory of Takeovers" and cited a few studies to support his theory. He neither measured nor performed empirical analysis to support various FCF hypotheses. Nevertheless the FCF concept has become very popular among financial statement preparers, financial analysts, academics, and textbook authors. The purpose of this paper is to review and critique the definitions, measurement, and use of the FCF concept in existing literature and in financial reporting.

The paper is organized as follows. First, we discuss the importance of cash flow in financial analysis and business decision making. Second, we discuss the use of the FCF concept in financial research. Third, various definitions of FCF in finance and accounting textbooks are described and the different measures of FCF are calculated for a single firm. Fourth, the use and regulation of FCF in financial reporting is described. The paper ends with conclusions and recommendations for a course of action needed for the future use of this concept.

IMPORTANCE OF CASH FLOW

Cash flow is a not only a popular term, but it is an important concept in the academic disciplines of accounting, finance, and economics and in all business operations. Both the level of, and change in, cash flow provide useful information in assessing a firm's performance and its future direction. Net income as reported on an income statement is the result of an accrual basis (not cash basis) accounting system. It is probably the most popular number disclosed by all business entities. It is watched by analysts, investors, media reporters and all stakeholders, but it is not cash! Accounting income can be used as information in projecting future cash flows, but it is cash, not accounting income, that buys things, and pays for wages, salaries, taxes, interest and dividends, services and debt. Inadequate cash can lead to default on outstanding liabilities and ultimately bankruptcy. Cash flow models are used for valuation of securities, properties, mergers, acquisitions, capital assets etc. Thus the popular phrase, "Cash is King."

Operating cash flow or cash flow from operations (CFO) is the one of the three major cash flow numbers in the statement of cash flows (SCF), and by far the most important of the three. The CFO represents a business' cash generating ability from its core activities. For example, Caterpillar Inc.'s core activity is manufacturing earth-moving machineries, not selling stocks and bonds or selling a subsidiary business. In spite of the importance of the SCF, very few textbooks or publishers of industry averages have ratios based on information available in the SCF in general or the CFO in particular. Bhandari (2003) has discussed the importance of the SCF and listed a few textbooks and many journal articles which suggested a number of the CFO-based ratios for analyzing and evaluating a firm. In a review paper Bellovary et.al. (2007) found that out of 165 bankruptcy prediction studies none used FCF as a predictor variable but 64 used the CFO.

The phrase "free cash flow" is an intuitively appealing concept to both laymen and analysts. The pre-fix "free" makes FCF a very attractive and meaningful term for all the stakeholders in an organization whether for-profit or non-profits. FCF can be perceived as funds distributable to shareholders or spendable by managers or both. However, since Jensen's (1986) definition of FCF has subjective components, it allows analysts, researchers, and managers to use their discretion and personal biases in calculating a firm's FCF. Analyst's choice of "all projects that have positive net present value" and "cost of capital" can influence the measurement of FCF. Therefore, unless a standardized metric is agreed upon by academics and professionals, FCF will be more suitable for intra-company analysis, discussion and decision making rather than inter-company comparison. In spite of its limitations FCF is an interesting concept. It provides useful information to all stakeholders. Many investment advisory services and websites explain FCF and some business firms are voluntarily reporting FCF.

USE OF THE FCF CONCEPT IN FINANCIAL RESEARCH

Subsequent to Jensen's (1986) paper, researchers have used the FCF concept in many different contexts. FCF has been used to test theory in dividend policy (Agarwal and Jayaraman, 1994; Bowden and Posch, 2011; Fuller and Blau, 2010), valuation (Awasthi et.al., 2013; Phillips, 2003; and Vogt and Vu, 2000 and Shefrin, 2014), portfolio performance (Hackel, 1994; Krueger and Wrosland, 2013), wealth effect (Lee, 1998), share repurchase (Vafeas and Jo,y 1995; Choi and Park, 1997), sales growth (Brush et.al., 2000), international joint venture (Chen et.al., 2000), operating performance (Freund et.al., 2003), straight debt issues (Howton et.al., 1998), advertising budget (Joseph and Richardson, 2002), golden parachutes (Subramaniam and Daley, 2000), capital structure (Buus, 2015), stock prices (Decamp et.al., 2011), bankruptcy (Dhumale, 1998), and audit fees (Griffin et.al., 2010) to name a few. Most of these researchers used their own calculation of FCF.

Most of FCF related research can be divided into two groups. The first group involves research papers which defined, measured and performed empirical analysis to support their hypothesis; however, these all had their own unique FCF metrics. Space limitations do not allow us to list each of these metrics but a few examples follow: Agrawal and Jayraman (1994), Vafeas and Joy (1995) and. Lee (1998) measured FCF as operating income before depreciation, minus interest expense, taxes, and dividends (both common

and preferred). Hackel et.al. (1994) used two definitions of FCF and discussed deficiencies in estimating FCF. According to them "FCF is net operating cash flow in excess of capital expenditure and a second, that is equivalent to the first but adds back discretionary cash flows..." Phillips (2003) used FCF as CFO less the increase in plant and net working capital. Freund et.al. (2003) and Choi and Park (1997) both measured FCF based on all income statement data and none from the SCF. Howton et.al. (1998) defined FCF equal to operating income minus interest minus cash dividends minus net taxes.

The second group of researchers simply inserted FCF in the title of their paper but neither defined nor measured FCF, much less used it in their empirical analysis. These remind us of the famous commercial, "where is the beef?" For example see the papers of Bowden and Posch (2011), Decamps et.al. (2011), and Fuller and Blau (2010). Bowden and Posch (2011) invoked the FCF concept as a constraint on managerial bonuses and shareholder dividends without defining and calculating FCF or performing empirical analysis. Decamps et.al. (2011) likewise indirectly connected FCF with undistributed profits, which managers use to their advantage - an agency conflict scenario. Fuller and Blau (2010) referenced the FCF problem in connection with high and low dividend payment policies. Their empirical model did not have FCF as a test variable. Dhumale (1998) claimed validation of FCF theory without computing FCF much less including it as one of the predictor variables in his bankruptcy prediction model. He tried twenty-one ratios to construct the model. Four ratios had cash flow in the numerator but not a single ratio had FCF. Kissan and Richardson (2002) used change in discretionary money and Subarmaniam and Daley (2000) used net capital expenditure to asset ratio as a surrogate for FCF.

Awasthi et.al. (2013) investigated the relationship between different FCF metrics and the value of the firm; the unique feature of their study is that they calculated a number of FCFs from publicly available information. Krueger and Wrosland (2013) used FCF data from Morningstar, Inc. to construct a more efficient portfolio. Stephen and Vu (2000) used Value Line's "Large free Cash Flow Generator" data to test Jensen's (1986) FCF hypothesis. Mills et.al. (2002) list twelve different definitions of FCF in use by corporations, magazines, textbooks, and publishers of financial information. In the light of the discussion above, it is obvious that there are just too many metrics of FCF being used to draw conclusions which leads to the question of whether these conclusions would hold if an alternative metric was used.

DEFINITION AND CALCULATION OF FCF IN FINANCE AND ACCOUNTING TEXTBOOKS

Many textbook authors have defined and presented a formula for FCF. There is no unanimity among them and when applied to the financial data of a company (Caterpillar Inc. as an example here, see Appendix A for key financial statement data) we get different numbers.

Brigham and Houston (2016, p.75) define FCF as "the amount of cash that could be withdrawn without harming a firm's ability to operate and to produce future cash flows." Their measurement formula and calculation (in millions) of Caterpillar's FCF for the year 2014 is:

$$FCF_{Brigham} = [EBIT\ (1\text{-}Tax\ rate) + Depreciation] - [Capital\ Expenditure +/- \Delta\ Net\ Operating\ Working\ Capital] \quad (1)$$

$$= [6{,}191\ (1\text{-}.2715) + 2{,}795] - [3{,}379\ -662] = \mathbf{4{,}588}$$

It is important to note that there is also variation in the calculation of net operating working capital (NOWC). Not all of the textbooks that include NOWC in their calculation of FCF specifically define how they calculate NOWC. In all of our calculations we calculate NOWC as: (Cash + Accounts Receivable + Inventories) – (Accounts Payable + Accrued Expenses).

Ross et.al. (2013, p.32), while admitting that "in practice there is some variation in exactly how free cash flow is computed," prefer to use the term "total cash flow" or "distributable cash flow" rather than FCF and measure it as operating cash flow, which they define as earnings before interest and depreciation and less taxes, adjusted for capital spending and the change in net working capital. While they do not provide a formula for their calculation, we have constructed the following formula based on their explanation of the concept.

FCF_{Ross} = EBITDA (1-Tax Rate) – Capital Expenditure +/- ΔNet Working Capital (2)
= 9,354(1-.2715) – 3,379 + 48 = **3,483**

Cornett et.al. (2012, p.48) take the perspective that FCF is cash available for distribution to the company's investors (including both creditors and stockholders) and define it as "after-tax operating profit minus the amount of new investment in working capital, fixed assets, and the development of new product," i.e.

$FCF_{Cornett}$ = [EBIT (1-Tax rate) + Depr.] – [ΔGross fixed assets + ΔNet operating working capital] (3)
= [6,191 (1-.2715) + 2,795] – [256 -662] = **7,711**

Brealey et.al. (2015, p.67) define FCF as cash available for distribution to investors after the firm pays for new investments or additions to working capital. Their computation is simply cash flow from operations minus capital expenditure; both numbers are available from the SCF. Schroeder et.al. (2014, p.266) and Stice and Stice (2014, p.23-23) use the same formula as Brealey et.al. (2015). Schroeder et.al. (2014) argue, however, that a more correct measure of FCF would be cash flow from operations less capital expenditures necessary to maintain current growth, but recognize that we have to estimate it using all capital expenditures since capital expenditures necessary to maintain current growth can't be found in the financial statements. Stice and Stice (2014) measure FCF as cash flow from operations less capital expenditures, and use discounted estimated future FCF to estimate the current value of the firm. FCF for Caterpillar under this formula would be:

$FCF_{Brealey}$ = CFO – Capital Expenditure (4)
= 10,191 – 3,379 = **6,812**

Kieso et.al. (2013, p.234) define FCF as "discretionary cash flow" otherwise cash available for a company to "purchase additional investments, retire its debt, purchase treasure stock, or simply add to its liquidity." They measure FCF as cash flow from operations less capital expenditures and dividends. This calculation is also consistent with the Phillips et.al. (2016, p.550) description of FCF as cash flows from operations over that which is needed "for replacing existing property, plant, and equipment and to pay dividends to stockholders." Phillips et.al. (2016) do not give a specific calculation for FCF. The Kieso (2013) formula is as follows.

FCF_{Kieso} = CFO – Capital Expenditure – Dividends (5)
= 10,191 - 3,397 – 1,620 = **5,192**

Palepu and Healy (2013, p.5-26) calculate two different measures of FCF, one that is FCF to both debt and equity holders (FCFDE) and one that is free cash flow to just equity holders (FCFE). Both of their FCF measures can be calculated by starting with CFO from the cash flow statement. In the FCFDE, CFO is first adjusted for after-tax net interest expense or income and then subtracting net cash flow used for investing activities. In FCFE, the CFO is not adjusted for after-tax net interest expense or income, and the net cash flow used for debt repayment and issuance as well as the net cash flow used for investing activities is subtracted. The two formulas are as follows:

$FCFDE_{Palepu}$ = [CFO+/- (Net Interest Expense (1-T)] – Net Cash Flow used for Investing Activities (6)
= [10,191 + 1,108(1-.2715)] – 3,672 = **7,326**

$FCFE_{Palepu}$ = CFO – Net Cash Flow used for Investing Activities – Net Cash Flow used for Debt Repayment and Issuance (7)
= 10,191 – 3,672 + 2,444 = **8,963**

It's important to note that in 2014, Caterpillar had a net positive cash flow (cash from rather than cash used for) from debt repayment and issuance, which is why the 2,444 is added rather than subtracted in the above calculation.

The reader can see that FCF for Caterpillar Inc. for year 2014 can range from $3,483 to $8,963 depending on which viewpoint and textbook is followed. This calls for an urgent need for consensus among academics and professionals to precisely define and measure FCF.

USE OF FCF IN FINANCIAL REPORTING

In 1987, the Financial Accounting Standards Board (FASB) released Statement of Financial Accounting Standard No. 95 (SFAS 95) (1987) now codified under FASB Accounting Standards Codification (ASC) 230-10. ASC 230-10 requires the issuance of a SCF and provides guidance on the form and content of that statement. ASC 230-10 neither defines nor requires the disclosure of FCF. Companies that fall under the jurisdiction of the US Securities and Exchange Commission (SEC) may still report financial metrics, such as FCF, that are not defined by US Generally Accepted Accounting Principles (US GAAP) as long as the disclosure of such measures are within the boundaries of SEC regulation. The disclosure of FCF as a part of a company's financial reporting has gained popularity over the last 25 years. Adhikari and Duru (2006) examine 10-K and 10-Q reports filed between 1994 and 2004 and document that the disclosure of FCF increased from 12 companies in 1994 to 176 companies in 2004 with 429 companies disclosing FCF at least once during the 10 year period. Unfortunately, because US GAAP does not define a standard measure of FCF, there is variance in the FCF measures that are disclosed.

Two viewpoints of FCF are discussed in the context of financial reporting: the capital maintenance viewpoint, where FCF represents the amount of cash that management can spend without reducing the productive capacity of the business, and the all-inclusive viewpoint, where FCF represents the amount of cash available to be spent at management's discretion (Adhikari and Duru, 2006; Mills et.al., 2002). While it appears that the capital maintenance viewpoint is the viewpoint most widely accepted by US regulators (SEC 2016), international standard-setters (IASB, 2014a; IASB, 2014b), and financial statement preparers (Adhikari and Duru, 2006; Mills et.al., 2002), there is variation in how FCF under the capital maintenance viewpoint is calculated and some companies still report FCF under the all-inclusive viewpoint. Ahikari and Duru (2006) subdivide their sample based on the starting point of the calculation of FCF. 55.6% of their sample used CFO as reported in the SCF as the starting point for FCF. Of those, 72.6% took a capital maintenance perspective and calculated FCF using one of the following four formulas:

FCF = CFO – capital expenditures (consistent with Brealy, 2006) (8)
FCF = CFO – capital expenditures – net working capital (consistent with Ross et.al. 2013) (9)
FCF = CFO – nonrecurring charges – maintenance based capital expenditures (10)
FCF = CFO – investing activity (11)

The other 27.4% took an all-inclusive viewpoint and calculated FCF using one of the following three formulas:

FCF = CFO – capital expenditures – debt payment (12)
FCF = CFO – capital expenditures – dividend (consistent with Kieso et.al. 2013) (13)
FCF = CFO – investing activity – dividend (14)

Ahikari and Duru (2006) also document that 14.2% of their sample calculate FCF using a starting point of either EBITDA or Net Income (which they do not subdivide by viewpoint) and 30.2% use some other type of calculation that could not be easily categorized. Mills et.al. (2002) provides two examples of

companies that calculate FCF under the capital maintenance viewpoint, but using calculations that are unique to those documented by Adhikari and Duru (2006) as follows:

FCF = CFO – "business investments" where "business investments" are selected investing activities (15)
FCF = Income from Operations + pre-opening expenses + abandonment loss + depreciation + amortization + interest + dividends + other income – cash taxes paid + proceeds from disposal of equipment and other assets (16)

In recent years the SEC has expressed concern and has increased regulation over the disclosure of non-GAAP measures in general, and the disclosure of FCF specifically. The SEC, under Regulation S-K, requires that any non-GAAP measure included in an SEC filing must be reconciled to the most directly comparable GAAP measure (SEC, 1933). In the case of FCF, this would be CFO. In 2003, they passed Regulation G which requires the same reconciliation for all non-GAAP measures included in voluntary earnings disclosures (SEC, 2003). In May 2016, the SEC updated the Compliance and Disclosure Interpretations on the use of non-GAAP measures in SEC filings (SEC, 2016). In the updates, the SEC specifically allowed the disclosure of FCF; however, they expressed concern over the fact that there is not a uniform definition for FCF and that its title is not descriptive of how the measure is calculated. To address these concerns, they required a description of how the measure is calculated in addition to the required reconciliation to GAAP cash flows. The SEC assumed a capital maintenance viewpoint of FCF and indicated that they would consider it misleading for a company to represent FCF as a measure of cash available for discretionary spending when it often does not take into account debt service or other non-discretionary expenditures. Finally, the SEC disallowed the presentation of FCF on a per share basis as they view it as a measure of liquidity rather than a performance measure.

While the use of FCF is on the radar of accounting standard setters, they have yet to define or incorporate FCF in their financial reporting requirements. The International Accounting Standards Board (IASB), who writes the International Financial Reporting Standards (IFRS) used by much of the world, have both encouraged (but not required) companies to disclose separately cash flows that increase operating capacity and cash flows required to maintain current operating capacity (IASB, 2014a) so that a measure of FCF can be calculated and expressed concern that the distinction between cash flows that increase and cash flows that maintain operating activities would be arbitrary (IASB, 2014b). The FASB has been silent on the issue of FCF specifically; however, FASB Chairman Russell Golden indicated in an April 2016 video that they anticipate issuing an agenda consultation paper to discuss potential improvements to or new types of financial metrics for the SCF (Davine et.al. 2016).

CONCLUSION AND RECOMMENDATIONS

Jensen (1986) introduced the idea of FCF in the context of agency theory. He hypothesized that FCF, if not paid out to shareholders, encourages managers to invest in unprofitable projects. Since then academics have used a variety of metrics of FCF to investigate a variety of financial issues. Due to the fact that FCF is not defined as an accounting concept under US GAAP, the FCF metrics used will be at the discretion of academic researchers, financial statement users, financial statement preparers, and textbook publishers. The conclusions drawn using these measures will be biased, difficult to interpret and may not hold under an alternative measure of FCF. While discretionary FCF measures may be useful in intra-firm analysis and decision making purposes, for inter-firm analysis a standardized FCF metric is imperative. We suggest the following guidelines to develop a standardized FCF metric:

1. It must be simple
2. It should be based on information derived from the SCF
3. It should start with the CFO
4. It should follow the all-inclusive viewpoint and adjust CFO for capital expenditures and contractual cash obligations unaccounted for (e.g. taxes, debt service, preferred dividends)
5. The focus should be stockholders

6. It should be supported by the FASB and included in US GAAP.

Until a consensus is developed, we recommend the following calculation of FCF:

FCF = CFO – Capital Expenditures – Debt Payments (17)

In our opinion FCF is supposed to be "free" cash available for distribution to stockholders after capital expenditures needed to sustain current operations (not growth) and other non-discretionary cash flow needs are met. Management's wasteful use of this "free" cash in unprofitable projects is consistent with the agency problem propounded by Jensen (1986). We believe that the above formula is in the spirit of the original FCF measure proposed by Jensen (1986). While the suggested calculation does not distinguish between maintenance capital expenditures and growth capital expenditures or include cash paid for preferred dividends, it is simple and all numbers can be obtained from the SCF. Since the SCF contains information using a standard measurement as prescribed by US GAAP, a FCF measure derived from the SCF will be more reliable for inter-firm analysis than discretionary FCF measures.

REFERENCES

Adhikari, A. & Duru, A. (2006). Voluntary Disclosure of Free Cash Flow Information. *Accounting Horizons,* 20, (4), 311-332.

Agrawal, A. & Jayraman, N. (1994). The Dividend Policies of All-Equity Firms: A Direct Test of the Free Cash Flow Theory. *Managerial and Decision Economics*, 15, (2), 139-148.

Awasthi, V., Chipalkatti, N. & De Mello e Souza, C. (2013). Connecting Free Cash Flow Metrics to What Matters for Investors: Accuracy, Bias and Ability to Predict Value. *Journal of Applied Finance,* 23, (2), 104-119.

Bowden, R. J. & Posch, P. N. (2011). The Bonus Pool, Market to Market and Free Cash Flow: Producer Surplus and its Vesting in the Financial Markets, *Applied Financial Economics,* 21, (24), 1843-1857.

Brush, T., Bromily, P. & Hendrickx, M. (2000). The Free Cash Flow Hypothesis for Sales growth and Firm Performance. *Strategic Management Journal,* 21, (4), 455-472.

Brigham, E. F. & Houston, J. F. (2016). *Fundamentals of Financial Management,* 14th Ed. Boston, MA: Cengage Learning.

Brealey, R., Myers, S. & Marcus, A. (2015). *Corporate Finance,* 8th Ed. New York, NY: McGraw Hill.

Buus, T. (2015). A General Free Cash Flow Theory of Capital Structure. *Journal of Business Economics & Management,* 16, (3), 675-695.

Chen, S., Ho, K. W., Lee, C. & Yeo, G. H. (2000). Investment Opportunities, Free Cash Flow and Market Reaction to International Joint Ventures. *Journal of Banking & Finance,* 24, (11), 1747-1765.

Choi, D. & Park, S. (1997). Targeted share repurchase, free cash flow, and shareholder wealth: Additional evidence. *Managerial Finance,* 23, (3), 49-63.

Cornett, M., Adair, T. A. & Notsinger, J. (2012). *Finance: Application and Theory,* New York, N.Y.: McGraw Hill.

Davine, C., Mitrovich, L. & Mazor, C. (2016, May 27). SEC Urges Companies to Take a Fresh Look at non-GAAP measures. *Deloitte Insights,* Retrieved from http://deloitte.wsj.com/riskandcompliance/2016/05/27/sec-urges-companies-to-take-a-fresh-look-at-non-gaap-measures/.

Decamps, J., Mariotti, T., Rochet, J. & Villeneuve, S. (2011). Free Cash Flow, Issuance Costs, and Stock Prices. *The Journal of Finance,* 66, (5), 1501-1544.

Dhumale, R. (1998). Earnings Retention as a Specification Mechanism in Logistic Bankruptcy Models: A Test of the Free Cash Flow Theory. *Journal of Business Finance & Accounting,* 25, (7-8), 1005-1023.

Financial Accounting Standards Board (1987). *Statement of Cash Flows: SFAS No. 95.* Stamford, CT.

Freund, S., Prizes, A. & Vasudevan, G. (2003). Operating Performance and Free Cash Flow of Asset Buyers. *Financial Management,* 32, (4), 87-106.
Fuller, K. & Blau, B. M. (2010). Signaling, Free Cash Flow and "Nonmonotonic" Dividends. *The Financial Review,* 45, (1), 21-56.
Griffin, P. A., Lont, D. H. & Sun, Y. (2010). Agency Problem and Audit Fee: Further Tests of the Free Cash Flow Hypothesis. *Accounting & Finance,* 50, (2), 321-350.
Hackel, K. S., Livnat, J. & Rai, A. (1994). The Free Cash Flow/Small-Cap Anomaly. *Financial Analysts Journal,* 50, (5), 33-42.
Howton, S. D., Howton, S. W. & Perfect, S. B. (1998). The Market Reaction to straight Debt Issues: The Effect of Free Cash Flow. *The Journal of Financial Research,* 21, (2), 219-228.
International Accounting Standards Board (IASB) (2014a). Cash Flow Statements. *The Essentials – Issue #1.* Retrieved from http://www.ifrs.org/investor-resources/iasb-investor-education/documents/the-essentials/cash-flow-statements-december-2014.pdf.
International Accounting Standards Board (IASB) (2014b). Principles of Disclosure: issues relating to the cash flow statements and related disclosures. *Staff Paper,* Retrieved from http://www.drsc.de/docs/sitzungen/ifrs-fa/025/25_08b_IFRS-FA_DI_POD.pdf.
Jensen, M. C. (1986) Agency Cost of Free Cash Flow, Corporate Finance, and Takeovers. *American Economic Review,* 76, (2), 323-29.
Joseph, K. & Richardson, V. J. (2002). Free Cash Flow, Agency Costs, and Affordability Method of Advertising Budgeting. *Journal of Marketing,* 66, (1), 94-107.
Kieso, D. E., Weygandt, J. J. & Warfield, T. D. (2013). *Intermediate Accounting,* 15th Ed. Hoboken, NJ.: John Wiley & Sons, Inc.
Krueger, T. M. & Wrolstad, M. A. (2013). Portfolio Allocation Using Free Cash Flows and Other Methods. *Journal of Financial Issues,* 11, (2), 58-67.
Lee, H. W. (1998). A Free Cash Flow Explanation for the Wealth Effect of Seasoned Equity Offering. *American Business Review*, 16, (2), 100-108.
Mills, J., Bible, L. & Mason, R. (2002). Defining Free Cash Flow. *The CPA Journal,* 72, (1), 37-41.
Palepu, K. G. and Healy, P. M. (2013). *Business Analysis and Valuation,* 5th Ed. Mason, OH: Cengage Learning.
Phillips, F., Libby, R., & Libby, P. A. (2016). *Fundamentals of Financial Accounting,* 5th Ed. New York, NY: McGraw Hill Education.
Phillips, J. F. (2003). The Dilemma of Valuing Not-for-Profit Hospitals-Is Free Cash Flow the Answer? *Journal of Accounting and Public Policy,* 22, (4), 347-374.
Ross, S., Westerfield, R. & Jaffe, J. (2013). *Corporate Finance,* 10th Ed. McGraw Hill, New York, NY.
Schroeder, R. G., Clark, M. W. & Cathey, J. M. (2014). *Financial Accounting Theory and Analysis: Text and Cases,* 11th Ed. Hoboken, NJ: John Wiley & Sons, Inc.
Securities & Exchange Commission (SEC) (1933) Regulation S-K, 17 CFR Part 229.10. Retrieved from https://www.sec.gov/rules/final/33-8518.pdf.
Securities & Exchange Commission (SEC) (2003). Regulation G, 17 CFR Part. 244.100 –244.102. Retrieved from https://www.sec.gov/rules/final/33-8176.htm.
Securities and Exchange Commission (SEC) (2016). Non-GAAP Financial Measures, *Compliance and Disclosure Interpretations,* Section 102.07. Retrieved from https://www.sec.gov/divisions/corpfin/guidance/nongaapinterp.htm.
Shefrin, H. (2014). Free cash Flow, Valuation and Growth Opportunities Bias. *Journal of Investment Management,* 12, (4), 4-26.
Stice, J. D., & Stice, E. K. (2014) *Intermediate Accounting* 19th Ed. Mason, OH: South-Western, Cengage Learning.
Subramaiam, C. & Daley, L. A. (2000). Free Cash Flow, Golden Parachutes, and the Discipline of Takeover Activity. *Journal of Business Finance & Accounting,* 27, (1-2), 1-36.
Vafeas, N. & Joy, O. M. (1995). Open Market Share Repurchases and the Free Cash Flow Hypothesis G35, *Economic Letters,* 48, (3), 405-410.

Vogt, S. & Vu, J. (2000). Free Cash Flow and Long-Run Firm Value: Evidence from the Value Line Investment Survey. *Journal of Managerial Issues,* 12, (2), 188-207.

APPENDIX A

TABLE 1
KEY FINANCIAL STATEMENT DATA OF CATERPILLAR, INC.
(Dollars in millions)

Year	2014	2013
Total sales and revenues	55,184	55,656
Total interest expense	1,108	1,192
Operating profit (EBIT)	6,191	7,273
Income taxes	1,380	1,319
Profit (Net Income)	3,695	3,789
Cash	7,341	6,081
Receivables – trade and other	7,737	8,413
Inventories	12,205	12,625
Current assets	38.867	38,335
Accounts Payable	6,515	6,560
Accrued Expenses (including wages)	5,986	5,115
Current liabilities	27,877	27297
Gross Property, Plant, and Equipment	31,572	31,316
Cash flow from operating activities (CFO)	**8,057**	**10.191**
Depreciation and amortization	3,163	3,087
Depreciation (per financial statement footnotes)	2,795	2,710
Cash flow from investment activities (CFI)	**(3,627)**	**(5,046)**
Capital expenditure	(1,539)	(2.522)
Expenditures for equipment leased	(1,840)	(1.924)
Other CFI items - net	(248)	(600)
Cash flow from financing activities (CFF)	**(2,996)**	**(4,511)**
Dividends	(1.620)	(1,111)
Debt Payments	(9,248)	(10,870)
Debt Issuance	11,692	9,259

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