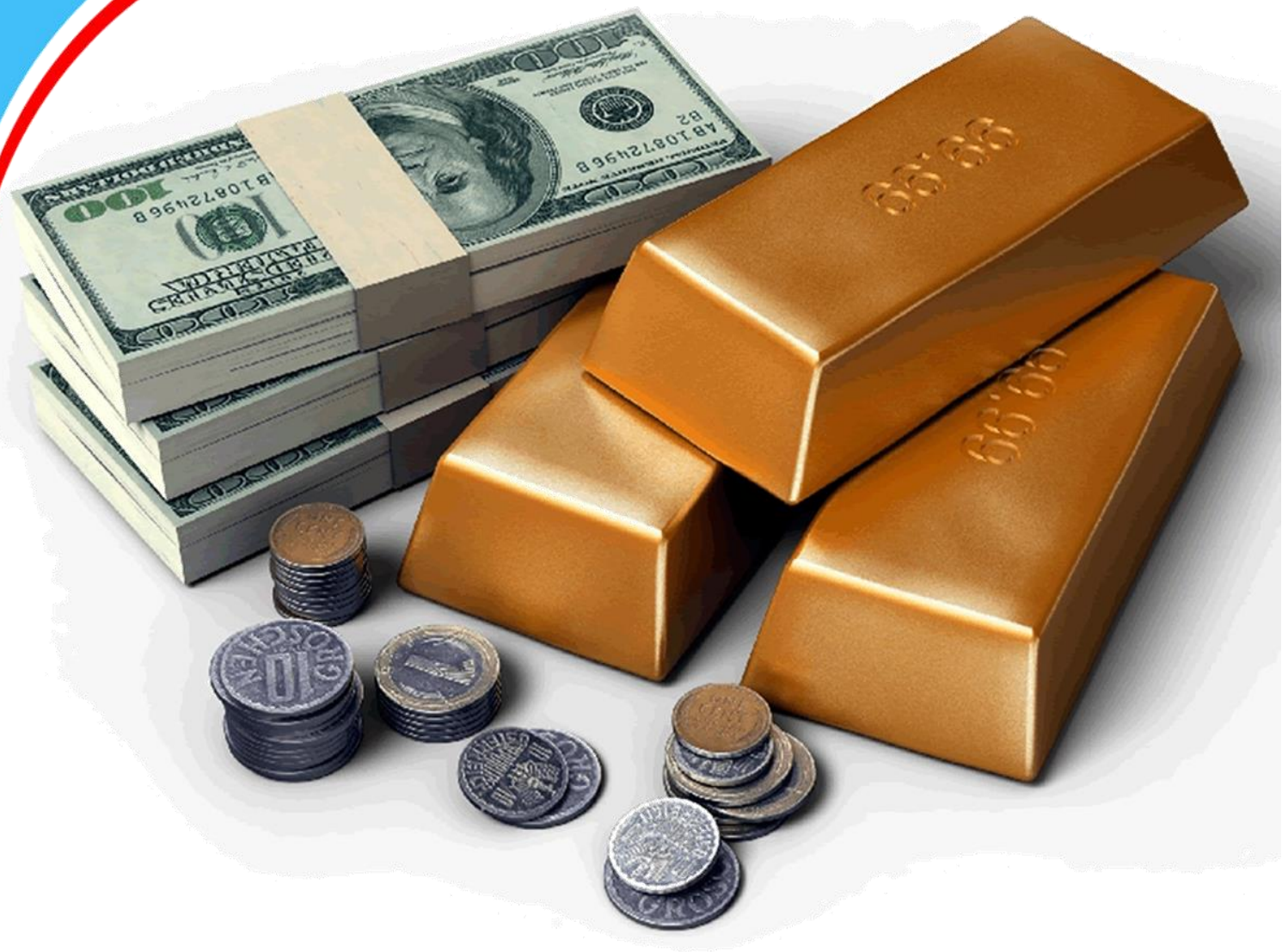
American Journal of
Finance
(AJF)



Integration of Free Cash Flow (FCF) with Cash Flow Based Corporate Finance (CFCF) Model

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American Journal of Finance
ISSN 2520-0445 (Online)
Vol. 12, Issue 1, pp 64 - 86, 2026
www.ajpojournals.org

Integration of Free Cash Flow (FCF) with Cash Flow Based Corporate Finance (CFCF) Model

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Article history
Submitted 14.04.2026 Revised Version Received 10.05.2026 Accepted 09.06.2026

Abstract

Purpose: To contribute the five functions- capital budgeting, merger& acquisition, valuation, capital structure and dividend policy- of cash flow based corporate (CFCF) model.

Methodology: Integration of free cash flow (FCF) with capital budgeting, merger& acquisition, and valuation is fulfilled through free cash flow (FCF) discounting. Integration of free cash flow (FCF) with capital structure and dividend policy is fulfilled through free cash flow (FCF) distribution depending on FCF availability to pay dividend or/and stock buyback and again capital structure adjustments depending on FCF availability.

Findings: This is not an empirical study so there is no any finding.

Unique Contribution to theory, Practice and Policy There is an assumption before these integration operations. This is the acceptance of Yilmaz (2024)'s free cash flow (FCF) calculation method as a precondition for all integration operations of the five functions. This assumption should be applied before the operations.

Keywords: *Free Cash Flow (FCF), Free Cash Flow Based Corporate Finance (CFCF) Model, FCF Calculation Methods, Yilmaz (2024b)'S FCF Calculation Method*
JELCode: *G30*

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INTRODUCTİON

Cash flow based corporate finance (CFCF) model is an independent corporate finance or corporate financial management model. It is not a planning or value based management model. It has beed designed to consider "cash flows" more important than "accrual" based corporate finance. However, it is not thought as an alternative to the accrual based or traditional corporate finance model. It is thought as a complementary corporate finance tool to the traditional corporate finance. The most important opinion was the question "could bankrucpty be blocked if cash flows are considered more important than the accrual based corporate finance?" during starting the preperation of the CFCF model. The most important handicap to understant the model is the 30 ratios which are calculated using the three financial statements balance sheet, income statement, and statement of cash flow. At the same time, the reader could confuse the subject with the theory of financial analysis because of abundant use of accounting data.Yilmaz explained this kind of information in six article given the next paragraph and the source list.

Cash flow based corporate finance (CFCF) model was built by Yilmaz (2022) and improved by Yilmaz (2023a). The six functions[2] of the model were explained by Yilmaz (2023b, 2024a, 2024b, 2024c). The functions are working capital management,capital budgeting, Merger& Acquisition, capital structure, dividend policy, and valuation.

However, the free cash flow dimension of the model was not considered during the model's building. Actually, Yilmaz (2021) explained about the use of free cash flow in corporate finance. However, that knowledge is very little and there is not connected to CFCF model because the model had not been created yet as it could be seen above from the six articles' publishing years.

In this article, some literature will be added to five functions of the six functions given above.That is, expect working capital management all functions of the model will be added free cash flow to improve the CFCF model.

An Assumption for All the Coverage of This Article

The assumption

For FCF integration with all five functions of this article, Yilmaz (2024b)'s FCF calculation method will be accepted. This method is expressed as follows:

FCF = CFF0 [3]*- Capital Expenditures - Property,Plant,*

and Equipment Purchased via a M&A..... (1)

Fourteen writers contributing this article with their opinions in capital structure and dividend policy and FCF discounting methods in capital budgeting, M&A, and valuation functions have their own FCF calculating methods. The writers are Ferris et.al. (1992), Moyer et al. (1995), Ross (2003), Keown et.al (2005,Verminnen et.al. (2005), Vishwanath (2007), Brigham and Houston (2009), Brealey et.al. (2011), Bekaert and Hodrick (2012), Damodaran (2012), Palepu and Healy (2013), Rupic et.al (2017), Bhandari and Adams (2017), and Berk and DeMarzo (2017).

Contributions of the writers to the cash flow based corporate finance (CFCF) model are shown at the Table 1 as follows:

[2] The model covered eight functions in Yilmaz (2022), but it was decreased to six functions in Yilmaz (2023a). The reasons were explained in the article Yilmaz (2023a).
[3]CFFO: Cash flow from operations.

Table 1: Contributions of Some FCF Writers to Five Functions of CFCF Model

CFCF Function	Contributing Writer/Writers
Capital Budgeting	Bekaert and Hodrick (2012) and Berk and DeMarzo (2017)
M&A	Moyer et.al. (1995)
Capital Structure	Ferris et.al.(1992), Moyer et al. (1995), Keown et.al. (2005), Verminnen (2005), Vishwanath (2007), Brigham and Houston (2009), Brealey et al. (2011), Bekaert and Hodrick (2012), Damodaran (2012), Ross et.al (2013), Palepu and Healy (2013), Rupic et.al.(2017), Berk and DeMarzo (2017), and Bhandari and Adams (2017)
Dividend Policy	Ferris et.al.(1992), Moyer et al. (1995), Verminnen (2005), Bekaert and Hodrick (2012), Palepu and Healy (2013), and Rupic et.al.(2017)
Valuation	Verminnen et.al.(2005), Brigham and Houston (2009), Brealey et.al.(2011), Damodaran (2012), Rupic et al. (2017), and Berk and DeMarzo (2017)

They are different than that of from the each other and from Yilmaz (2024b).

The FCF calculation methods are explained shortly at below like that:

1.) Ferris et.al. (1992) calculate the FCF as follows:

FCF= CFFO - Any Required Cash Disbursements in the Subsequent Periods .....(2)

To explain "Any Required Cash Disbursements in the Subsequent Periods", they give some examples such as dividends, currently maturing debt payments, or the like a sinking fund payment for the items will be subtracted from the CFFO.

2.) Moyer et al. (1995)'s calculation of FCF is expressed as follows:

$$FCF = CF - I^{4}(1-T) - Dp - Pf - B - Y \quad \text{.....} \quad (3)$$

Where**:**

CF: after-tax operating cash flow,
I: before- tax interest payment,
T: tax rate,
Dp: preferred stock dividend payment,
Pf: required redemption of preferred stock,
B: required redemption of debt,
Y: investment in property, plant and equipment required to maintain cash flows at their current levels.

3.) Ross et al.(2003)'s calculation of FCF is expressed as follows:

FCF= Operating Cash Flow – Net capital spending - Change in net working capital (NWC)..... (4)

They say that the concept "free cash flow" is used instead of "cash flow from assets". They think that the two concepts have same meaning.

[4] The article says that if a firm has interest income, this is netted out against interest expense. If interest income exceeds interest expense, FCF will increase by the amount of the net after-tax interest income.

Calculation of the items they used is expressed as follows:

Operating Cash Flow= Earnings before interest and taxes (EBIT) +Depreciation – Taxes.....(5)

Net capital spending = Ending net fixed assets - Beginning net fixed assets +Depreciation..... (6)

Change in net working capital (NWC)= Ending net working capital (NWC)-Beginning net working capital (NWC)..... (7)

4.) Keown et.al (2005) calculation of FCF is expressed as follows:

FCF= After tax operating cash flows - investment in assets ..... (8)

They calculate "After tax operating cash flow" as follows:

After tax operating cash flow = Earnings Before Interest Tax Depreciation and Amortization (EBITDA) –Cash Taxes (9)

The writers' calculation of "Cash Taxes" is expressed as follows:
Cash Taxes= Provision for income taxes – Change in income tax payable.....(10)

The calculation of "Investment in assets" is expressed as follows:

Investment in assets= Change in net operating working capital + Change in gross fixed assets and other assets.....(11)

5.) Verminnen et.al. (2005) calculate FCF as follows:

FCF [5]=EBIT (1-Tax rate) +Depreciation – Change in working Capital[6] -Net capital expenditure (Capex)..... (12)

6.) Vishwanath (2007) calculates FCF as follows:

FCF= Net Operating Profit After Tax (NOPAT) +Depreciation – Capital Expenditure – (+) Increases (Decreases) in Working Capital Investment..... (13)

The writer calculates net operating profit after tax (NOPAT) as follows:

NOPAT= EBIT (1- tax rate)..... (14)

The writer calculates the EBIT as follows:

EBIT= Revenue – Cost of goods sold –Operating expenses Depreciation .....(15)

7.) Brigham and Houston (2009) calculate FCF as follows:

FCF= EBIT (1-T) + Depreciation - [(Capital Expenditures +Increase in Net Working Capital)]..... (16)

[5] In this article, the concept FCF is used for the sake of standardization instead of FCFF which is used by the writers.
[6] The writers explain the reason of their decreasing the "change in working capital" in the p.480 like that: "Here we move from an accounting concept to a cash flow basis, thus we subtract the working capital needs". In my opinion, they mean that they decrease "change in working capital" to reach cash flow concept from accounting concept that covers only "tax and depreciation". This means that they believe that decreasing tax and depreciation from the Earning Before Tax (EBT) is not enough to calculate cash flow and more items are needed to reach "cash flow".

The writers calculate "Increase in Net Working Capital" as follows:

Increase in Net Working Capital= Change in Current Assets – Change in Payables and Accruals..... (17)

8.) Brealey et.al. (2011) calculate FCF cash flow as follows:

FCF= Earnings[7] – net investment..... (18)

The writers calculate net investment as follows:

Net investment = Total capital expenditures – Depreciation..... (19)

9.) Bekaert and Hodrick (2012) calculate FCF as follows:

FCF= GCF – CAPX – ΔNWC..... (20)

In here,
GCF: Gross Cash Flow
CAPX: Capital expenditures
ΔNWC: Change in net working capital
GCF could be calculated as follow:

GCF= NOPLAT (Net operating profit less adjusted tax) + Accounting Depreciation..... (21)

The writers calculate NOPLAT as follows:

NOPLAT = EBIT – Taxes on EBIT..... (22)

10.) Damodaran (2012) calculates FCF l as follows:

FCF[8]=EBIT (1-tax rate) +depreciation – capital expenditure – change in working capital..... (23)

11.) Palepu and Healy (2013) calculate FCF as follows:

FCF = EBIT[9] x (1-tax rate) + Depreciation and deferred taxes – Capital expenditures +/- increase/decrease in working capital.....(24)

12.) Rupic et al.l (2017) calculate FCF as follows:

FCF[10]=NI+NCC[11]+Int x (1-Tax rate) -Inv (FC) -Inv (WC).....(25)

[7] Earning means "net income after tax".

[8]In this article, the concept FCF is used for the sake of conceptual standardization instead of FCFF which is used by the writers.

[9] The writers have used the unshortened version of the EBIT. The writer of this article has changed the term for the standardization and harmonization with the other FCF calculation methods for the purpose of comparison with the other methods more easily.

[10] In this article, the concept FCF is used for the sake of conceptual standardization instead of FCFF which is used by the writers.

[11] "Amortization" and "depletion" are different concepts and accounting items than "depreciation". Amortization is written up for "intangible assets" such as goodwill, patents, copyrights, and franchise etc. Depletion is an accounting operation to show the cost of extracting natural resources from the earth. The

In here:
NI: Net Income available to common shareholders
NCC: Net Non-Cash Charges
Int x (1-Tax Tate): Interest Expense times x (1 - Tax rate)
Inv (FC): Investment in Fixed Capital
Inv (WC): Investment in Working Capital

13.)Bhandari and Adams (2017) offer a calculation for FCF as follows:

FCF= CFO[12] *- Capital Expenditure – Debt Payments .....(26)*

In here, CFO means "Cash Flow from Operations".

14.)Berk and DeMarzo (2017) calculate FCF as follows:

FCF = (Revenues – Costs)x (1-T_c) – CapEx – ΔNWC + (T_c x Depreciation)..... (27)

In here:

T_c : Corporate tax

CapEx : Capital expenditures

ΔNWC: Change in net working capital

T_c x Depreciation : Depreciation tax shield

Usability of the Methods as the FCF Calculation Method for this Article
Financial Statements Used to Calculate FCF

All of the methods use some items from three financial statements to calculate free cash flow. The financial statements used to calculate free cash flow are Cash flow Statement, Balance Sheet, and Income Statement.

Financial Statement/s used in the calculation methods are shown at the Table 2 at below.

examples for the natural resources are mine, oil, timber etc. This means that if a company is not an oil, mining, timber etc. company, there is no need for "depletion "operation in the accounting procedure. The writers think all the companies for the three concepts without separating their industries. Actually, the two accounting concepts valid all companies are depreciation and amortization. Depreciation is for tangible assets and amortization is for intangible assets. All the assets are fixed assets. Depletion is for only the companies operating in natural sources industry. This does not mean that depletion is enough for these companies. Depreciation and amortization are still valid for natural sources companies, too. These should not be confused by the readers of this article.

[12] The writers mean "operating cash flow" from the concept "CFO" becausethey have used CFO instead of cash flow from operations (CFFO) and operating cash flow in their literature review in their article.

Table 2: Financial Statements Used to Calculate FCF

Method no.	FCF Calculation Method	Cash Flow Statement	Income Statement	Balance Sheet
1	Ferris et.al. (1992)	+	-	-
2	Moyer et.al (1995)	+	-	-
3	Ross at. al. (2003)	-	+	+
4	Keown et.al. (2005)	-	+	+
5	Verminnen et.al. (2005)	-	+	+
6	Vishwanath (2007)	-	+	+
7	Brigham and Houston (2009)	-	+	+
8	Brealey et.al. (2011)	-	+	+
9	Bekaert and Hodrick (2012)	-	+	+
10	Damodaran (2012)	-	+	+
11	Palepu and Healy (2013)	-	+	+
12	Rupic at. al. (2017)	-	+	+
13	Bhandari and Adams (2017)	+	-	-
14	Berk and DeMarzo (2017)	-	+	+

Methods Calculate "Cash Flow" Using Income Statement and Balance Sheet

The FCF calculation methods using income statement and balance sheet to calculate FCF are Ross at. al. (2003), Keown et.al. (2005), Verminnen et.al. (2005), Vishwanath (2007), Brigham and Houston (2009), Brealey et.al (2011), Bekaert and Hodrick (2012), Damodaran (2012), Palepu and Healy (2013), Rupic at. al. (2017), and Berk and DeMarzo (2017).

The writers did not use cash flow statement in their FCF calculation methods. Their cash flow calculations are shown at the Table 3 at below:

Table 3: "Cash Flow" Calculation Methods Using Income Statement

Method	"Cash Flow" Calculation
Ross at. al. (2003)	Earnings before interest and taxes (EBIT) +Depreciation – Taxes
Keown et.al. (2005)	Earnings Before Interest Tax Depreciation and Amortization (EBITDA) –Cash Taxes
Verminnen et.al. (2005)	EBIT (1-Tax rate) +Depreciation
Vishwanath (2007)	Net Operating Profit After Tax (NOPAT) +Depreciation
Brigham and Houston (2009)	EBIT (1-T) + Depreciation
Brealey et.al. (2011)	Earnings[13] NO ANOTHER ITEM TO ADD OR SUBTRACT
Bekaert and Hodrick (2012)	NOPLAT (Net operating profit less adjusted tax) + Accounting Depreciation
Damodaran (2012)	EBIT (1-tax rate) +depreciation
Palepu and Healy (2013)	Earnings before interest and taxes x (1-tax rate) + Depreciation and deferred taxes
Rupic et.al (2017)	NI+NCC+Int x (1-Tax rate)
Berk and De Marzo (2017)	(Revenues – Costs)x (1-T_c) + (T_c x Depreciation)

All of these FCF calculation methods start to calculate FCF with an income statement item. It could be seen from the starting points that they try to approach to "operating cash flow".

As it could be seen from the Table 3, the common item being added to cash flow is depreciation. This represents "traditional cash flow "insight.

Another point in the FCF calculation methods shown in the Table 3 is being decreased of taxes.

Ross at. al. (2003) and Keown et.al. (2005) decrease taxes directly from their "cash flow" as "– taxes" and "– cash taxes", respectively.

[13] Earning means "net income after tax".

Verminnen et.al. (2005), Brigham and Houston (2009), Damodaran (2012), and Palepu and Healy (2013) decrease taxes as EBIT (1-tax rate). That is, these methods show their EBITs as "remaining earning and interest" after the tax.

AT (after tax) of NOPAT in Vishwanath (2007) and LAT (less adjusted tax) of NOPLAT in Bekaert and Hodrick (2012) show decreasing taxes.

Rupic et.al. (2017) add to the NI (net income) not only depreciation but also amortization and depletion. They term the three concept "NCC (Non-Cash Charges)". This is broader opinion than only depreciation.

Rupic et.al (2017) also add to the Net Income the "Interest (1- tax rate)". They explain the reason of this like that: "To estimate free cash flow to the firm by starting with Cash Flow from Operations (CFO), we must recognize the treatment of interest paid. If, as the case with U.S. GAAP, the after-tax interest was taken out of Net Income (NI) and out of CFO, after-tax interest must be added back in order to get FCFF."

Brealey et.al. (2011) calculate the tax on "before earning before tax".This method is already does not calculate "cash flow". It sees "earning after tax" like cash flow and subtract investments from it.

Berk and DeMarzo (2017) calculate tax in two stages. In the first stage, they decreases taxes from "revenues – costs". In the second stage, they add "Tc x depreciation". This means depreciation tax shield.This is thought like cash for a business.

All of these FCF calculation methods are not enough to produce an efficient FCF as a base of this article. Actually, to calculate free cash flow using income statement is a result of a missing insight. Through income statement, cash flow calculation is limited with income-tax-depreciation trichotomy. This is pretty missing to see real cash flow. For instance, a writer could miss many points by limiting himself/herself in income statement limits. Some of the items not included to cash flow if income statement is preferred to calculate cash flow are[14]:

-amortization except Keown et.al (2005),

-provision for losses on accounts receivable,

-increase in accounts receivable,

- decrease in inventory,

-increase in prepaid expenses,

-decrease in accounts payable and accrued expenses,

-increase in interest and income taxes payable,

-increase in deferred taxes except Palepu and Healy (2013).

Income statement based FCF calculation methods consider working capital in some levels are shown at the Table 4 at below.

[14] This opinion of this writer has been supported by the source "Financial Accounting Standards Board, "Statement of Financial Accounting Standards No. 95, Statement of Cash Flows, November, 1987.

Table 4: Status of Working Capital in the "Income Statement Based FCF Calculation Methods"

Method	Status of Working Capital
Verminen (2005) and Damodaran (2012)	– Change in working Capital
Vishwanath (2007)	–/(+) Increases (Decreases) in Working Capital Investment
Palepu and Healy (2013)	+/- increase/decrease in working capital
Rupic at. al. (2017)	-Inv (WC)[15]
Ross et.al. (2003), and Bekaert and Hodrick (2012)[16]	– Change in net working Capital
Keown et.al. (2005)	– Investment in assets[17]
Brigham and Houston (2009)	- [(Capital Expenditures +Increase in Net Working Capital)][18]
Brealey et.al. (2011)	NO WORKING CAPITAL ITEM TO ADD OR SUBTRACT
Berk and De Marzo (2017)	– ΔNWC[19]

The methods could be separated into two main groups about working capital insight. They are:

- the methods adopting gross working capital[20],

-the methods adopting net working capital[21]

The methods adopting gross working capital are Verminen et.al. (2005), Damodaran (2012), Vishwanath (2007), Palepu and Healy (2013), and Rupic at. al. (2017).

The methods adopting net working capital are Ross et.al. (2003), Bekaert and Hodrick (2012), Keown et.al. (2005), Brigham and Houston (2009), and Berk and De Marzo (2017).

Brealey et.al. (2011) do not cover any working capital item.

Verminen at.al. (2005) explain the reason of their decreasing the "change in working capital" in the p.480 like that: "Here we move from an accounting concept to a cash flow basis, thus we subtract the working capital needs

As a result, all income statement based FCF calculation methods start to calculate cash flow with EBT, EBIT, or EBITDA, then the income taxes are subtracted from these items. In so doing, after tax values are calculated. These values are still accrual. After adding depreciation[22], the cash flow is reached. This "cash flow" insight is not enough to reach the cash flow concept adopted in the cash flow statement.

[15] The writers explain it as "Inv (WC): Investment in Working Capital".

[16] The writers actually use a shortened version ΔNWC and they explain it as "Change in net working Capital".

[17] The calculation of "Investment in assets" is done as follows:
Investment in assets= Change in net operating working capital + Change in gross fixed assets and other assets (28)

[18] The writers calculate "Increase in Net Working Capital"as follows:
Increase in Net Working Capital= Change in Current Assets – Change in Payables and Accruals (29)

[19] The writers explain it as "Change in net working capital".

[20] It means a corporate's current assets.

[21] It means a corporate's "current assets – current liabilities".

[22] Keown et.al. (2005) and Rupic et.al. (2017) add some additional non-cash charges to the depreciation. These additions are "amortization" in Keown et.al. (2005) and "amortization and depletion" in Rupic et.al. (2017).

Methods Using Cash Flow Statement

The FCF calculation methods using cash flow statement are Ferris et.al. (1992), Moyer et.al (1995), and Bhandari and Adams (2017). These writers used only cash flow statement to calculate FCF. They are seen at the Table 5 as follows:

Table 5: FCF Calculation Methods Using Only Cash Flow Statement

The Writer	The FCF Calculation Method
Ferris et.al. (1992)	FCF= CFFO - Any Required Cash Disbursements in the Subsequent Periods
Moyer et.al (1995),	FCF = CF – I[23] (1-T) – Dp – Pf – B – Y
Bhandari and Adams (2017).	FCF= CFO[24] - Capital Expenditure – Debt Payments

A Method Considering "After Tax CFFO"[25]

Moyer et.al (1995) use "after tax CFFO" during their FCF calculation. It means "CFFO-Tax". It does not fit Yilmaz (2024b) FCF calculation method because Yilmaz (2024b) includes only "CFFO" during FCF calculation. There is no reciprocity between (CFFO-Tax) in the Moyer et.al (1995)'s FCF calculation method and Yilmaz (2024b)'s FCF calculation method.

The Methods Considering CFFO

Ferris et.al. (1992) and Bhandari and Adams (2017) used CFFO or similar concept during their FCF calculations. The two concepts used as a first item to calculate FCF are shown at the Table 6 at below.

Table 6: The First Items Used by the Two Writers Using Cash Flow Statement to Calculate FCF

Writer/s and Year	The First item
Ferris et.al. (1992)	CFFO
Bhandari and Adams (2017),	CFO

Table 7: "After CFFO" Items of the Writers to Calculate FCF

Method	Items after CFFO or Its Similar Concept
Ferris et.al. (1992)	- Any Required Cash Disbursements in the Subsequent Periods
Bhandari and Adams (2017)	- Capital Expenditure
	– Debt Payments

As it could be seen from the Table 7, Ferris et.al (1992) have given some examples for cash disbursements to be subtracted from the CFFO. These items are not exactly clear. For this reason, it could not be the accepted FCF calculation method for this article. In Yilmaz (2024b), the FCF calculation method is very clear and all of the items used in the FCF calculation method could be found from the cash flow statement, exactly. That is, this method is missing from the point of view of not covering capital investment spending via M&A, and excess from the point of covering cash dividend to decrease from net cash provided by operating activities. Bhandari and Adams (2017) consider not only capital expenditure but also debt payments to subtract from CFO. Yilmaz (2024b) does not think and does not accept to subtract "debt payments" because he thinks that if he decreases "debt payments" the product will not be Free Cash Flow (FCF), it will be Free Cash Flow For Equity (FCFE) anymore . However, Bhandari

[23] The article says that if a firm has interest income, this is netted out against interest expense. If interest income exceeds interest expense, FCF will increase by the amount of the net after-tax interest income.

[24] The writers means "operating cash flow" from the CFO because they have used CFO instead of cash flow from operations (CFFO) and operating cash flow in their literature review in their article.

[25] The writers start their FCF calculation with CF. They explain CF as "after-tax operating cash flow".

and Adams (2017) think that their calculation is FCF[26]. Yilmaz's general insight is FCF is the right of all investors of the business. There is not necessary to decrease "debt payments" during FCF calculation. If it is done like that their FCF could be thought as free cash flow for equity (FCFE). This will be distributed to the owners, not all investors. It does not cover the debtholders.

It could be said that none of these available cash flow statement based "starting with CFFO" FCF calculation methods meets Yilmaz's FCF calculation insight.

It could be said that Yilmaz (2024b)'s FCF calculation method is the most suitable FCF calculation to get a base to distribute to investors for the integration of FCF with the capital structure and dividend policy functions of CFCF model and to get a base to discount the FCF to calculate the discounted FCF for the integration of FCF with the capital budgeting, M&A, and valuation functions of the CFCF model.

Yilmaz (2024)'s FCF calculation method adopts unleveraged FCF or free cash flow for firm (FCFF) because its purpose is to calculate FCF for its all investors. The Yilmaz's main idea and purpose is to use the FCF to pay its long term debt (for bond), its interest payments, dividend payments and stock buyback for its owners, equity holders. Yilmaz's FCF calculation method substract the two capital investment items from the CFFO.Yilmaz does not adopt interest as an item of CFFO like GAAP which considerss interest different than CFFO. Most of the interest is paid for long term debt (bond) and the reason for issuing bond is capiyal investment and equisitions. For this reason, in my opinion, to add the interest back to the CFFO is unnecessary**.**

Yilmaz (2024)'s FCF calculating method is the only method which is calculated using cash flow statement and considering "Property,Plant, and Equipment Purchased via a M&*A*" in addition to the "Capital Expenditures" of the fifteen[27] FCF calculation methods given in this article. Yilmaz (2024)'s FCF decreases overal capital investment including capital investment fulfilled by a business and capital investment through acqusitions by the business from the CFFO. In my opinion, it could be though more valid and rational comparing with the other methods.

CFCF model is a new corporate finance model. It is not a planning or value based management model. It adopts cash flow based corporate finance, not accrual based or traditional corporate finance. However, it could be thought a complementary tool to accrual based finance. The two approaches coplete each other. The output of two approched could bring a stronger financial management to a business. CFCF model looks like a little bit the financial analysis tool because of thirty cash flow ratios. However,the ratios explain the six functions of the CFCF model function by function. Because of accounting content through the cash flow ratios it could be confused by financial analysis. At the same time, fort his reason, it could get less citation from the expected. It will be explained more in the near future to introduce learning gap because of the accounting content. Probably, Yilmaz will start its explanation with the functions, then he will use its cash flow ratios to explain the functions. Thet is, first, he will introduce the functions.The ratios will be used during the explanation of the functions.In doing this, the citation number could be increased.

[26] Bhandari and Adams (2017) suggest as a guideline to develop a standardized FCF metric that "the focus should be stockholders".This shows that they accept FCF for only stockholders. This is actually FCF for equity (FCFE). FCF and free cash flow for firm (FCFF) are true concepts for FCF covering all business with all financing sources.

[27] Yilmaz (2024)'s FCF calculation method in Equation 1 is added to the fourteen methods of this article's source writers'.

American Journal of Finance
ISSN 2520-0445 (Online)
Vol. 12, Issue 1, pp 64 - 86, 2026
www.ajpojournals.org

FCF Integration with CF Based Capital Budgeting

Bekaert and Hodrick (2012) and Berk and DeMarzo (2017) discount free cash flows in capital budgeting.

Bekaert and Hodrick (2012) say that if the initial capital expenditures associated with the project are included in the initial year's free cash flow, the NPV of the project, on an all-equity basis, it is expressed as follows:

$$NPV(t)= \sum^{\infty}{}_{k=0}\ E_t\,[FCF_{(t+k)}]\ /\ (1+r)^k \quad \ldots\ldots\ (30)$$

In here,

E_t : Expected time

t:time

r: the discount rate that is appropriate for the riskiness of the all-equity future cash flows

t+k: cash flows to time t as r (t,k)

The writers say that although the discount rate in the equation is assumed to be constant, in general, the discount rate is not required to be the same for each period in the future. They mean that the appropriate discount rate for each future period can be different. They denote that the rate that is appropriate for discounting can reflect differences in the time value of money for different periods in the future. They denote that the rate that is appropriate for discounting expected time t+k cash flows to time t as r (t,k).[28]

This opinion of the writers is very important for more realistic capital budgeting because inflation rates, risk levels, expected returns etc. could be changed in time so discounting rates should be changed,too.

Berk and DeMarzo (2017) think that a project's free cash flow is the incremental effect of the project on the firm's available cash, separate from any financing decision. They calculate present value of free cash flow l as follow:

$$PV\,(FCF_t)= FCF_t\,/\,(1+r)^t = FCF_t\,x\,[1/\,(1+r)^t] \quad \ldots\ldots\ (31)$$

This line of the formula 32 actually covers two different methods. They are:

1. $PV\,(FCF_t)= FCF_t\,/\,(1+r)^t$
2. $PV\,(FCF_t) = FCF_t\,x\,[1/\,(1+r)^t]$

In the two formulas:

r: cost of capital

$(1+r)^t$: t-year discount factor

FCF_t :present value of the free cash flow in year t

[28] The writers suppose that they develop explicit forecasts for the nex1 10 years. They suppose the final explicit forecast of free cash flow at time t for 10 years in the future be:

$$FCF \text{ at time } t \text{ for } 10 \text{ years} = E_t\,[FCF_{(t+10)}] \quad (32)$$

They assume that future free cash flow grows at the rate g, and let the discount rate for these perpetual cash flows be r. The starting value in year 11 is higher than the expected free cash flow in year on by (1+g). From the perpetuity formula for a growing cash flow, the terminal value in year 10 will be:

$$\text{Terminal value in year } 10 = [E_t(\,FCF_{(t+10)})\,(1+g]/(r-g) \quad (33)$$

After calculating the terminal value in year 10, it will be discounted to year 0 by dividing by (1+r). Terminal value in year 0 will be calculated like that:

$$\text{Terminal value in year } 0 = \text{Terminal value in year } 10/\,(1+r)^{10}. \quad (34)$$

The first method could be applied via future value interest table and the second method could sbe applied via the present value interest table from commonly used interest tables.

The two of the formül still give present value of free cash flows. For capital budgeting it PV is not enough. NPV is necessary to give a decision about an investment project.The writers say in the footnote 9 in their book's page 282 about the NPV calculation like that:

" We can also compute the NPV using the Excel NPV function to calculate the present value of the cash flows in year 1 through 5, and then add the cash flow in year 0 (i.e., "= NPV (r, $FCF_1 : FCF_5$) +FCF_0 ")."

In their calculation, they show investment cash out in the year 0 in parenthesis instead of with a negative sign.

As it could be seen from Bekaert and Hodrick (2012) and Berk and DeMarzo (2017) the two articles include investment project amount to the FCF discounting at the beginning of the investment, the year zero.

FCF Integration with CF Based Merger &Acquisitions

Moyer et.al. (1995) calculate the present value of the company's expected future "free cash flows" and compare this figure to the proposed purchase price to determine the proposed acquisition's net present value. The writers think that FCF concept is particularly important in long-range corporate financial planning and when evaluating the acquisition of a firm or a portion of a firm.

They say that when valuing a takeover prospect, it is important to recognize that explicit cash outlays normally are required to sustain or increase the current cash flows of the firm. They give an example about the acquisition of an oil production company. According to the writers, it is not correct to project current cash flows into an indefinite future without explicitly recognizing that crude oil reserves are a depleting resource that require continual significant investment to assure future cash flow streams.They add their opinions that the free cash flows from a merger should include any effects of synergy because of importance of marginal impact of the merger on the acquiring firm.

They use standard discounting method to discount the expected free cash flows to calculate the acqusition's net present value. The writers accept FCF concept to evaluate an acqusition offering or an acqusition probability. They already have a FCF calculation method given in the Chapter 2 of this article like all other source writers of this article.

FCF Integration with CF Based Capital Structure

Ferris et.al. (1992), Moyer et al. (1995), Ross (2003), Keown et.al (2005,Verminnen et.al. (2005), Vishwanath (2007), Brigham and Houston (2009), Brealey et.al. (2011), Bekaert and Hodrick (2012), Damodaran (2012), Palepu and Healy (2013), Rupic et.al (2017), Bhandari and Adams (2017), and Berk and DeMarzo (2017) have their opinions about the distribution free cash flow to different investor groups and to the business itself. The distribution groups are shown at the Table 8 at below:

Table 8: Distribution of FCF Among Investor Groups and A Business Itself

Investor Groups and Business Itself	Concept	The Writers
	-Stock buyback	(Ferris et.al.(1992), Verminnen (2005), Bekaert and Hodrick (2012), Palepu and Healy (2013), Rupic et.al.(2017)
	-Dividend	(Moyer et al. (1995), Verminnen (2005), Bekaert and Hodrick (2012), Palepu and Healy (2013), Rupic et.al.(2017)
	-Owners	(Keown et.al. (2005)
	-Shareholders (Stockholders)	Vishwanath (2007), Ross et.al (2013), Bhandari and Adams (2017)
Stockholders	-Common stockholders	Brigham and Houston (2009) Damodaran (2012) Rupic et.al.(2017)
	-Preferred stockholders	Brigham and Houston (2009) Damodaran (2012) Rupic et.al.(2017)
	-Early debt retirement	(Ferris et.al.(1992),
	-Debt service	(Moyer et al. (1995)
	-Creditors	(Keown et.al. (2005), Ross et.al (2013)
	- Interest	(Verminnen (2005) Bekaert and Hodrick (2012) Palepu and Healy (2013)
Bondholders	-Bondholders	Vishwanath (2007) Brigham and Houston (2009) Damodaran (2012) Rupic et.al.(2017)
	-Principal to bondholders	Bekaert and Hodrick (2012) Palepu and Healy (2013)
	-Debt repayment	Verminnen (2005)
Stockholders and Bondholders	-Investors	Brealey et al. (2011) , Berk and DeMarzo (2017)
	-Merger and takeover	(Ferris et.al.(1992),
	- Acquisition	Rupic et.al.(2017)
	-Some form of capital asset expansion	(Ferris et.al.(1992),
The Business Itself	-Investment in other projects	(Moyer et al. (1995)
	-Retained in the Corporation	Bekaert and Hodrick (2012) Rupic et.al.(2017

As it could be seen from at the Table 8, the created free cash flow (FCF) is distributed to the three main groups. They are stockholders, bondholders, and business itself. The the of them, stockholders and bondholders are investors of the business.

The writers of FCF support the payment of FCF to stockholders through six concepts. The concepts are stock buybacks, dividends, owners, shareholders (stockholders), common stockholders, and preferred stockholders. All of the payments decrease the owner's equity. If a company distributes some kinds of these payment from the FCF and does not distribute any kinds of debtholders from the FCF, the capital structure of a business changes in the route of debt increase. In this situation, debt/equity ratio increase so financial risk increase, and, of course, the financial cost increases, anymore.

The writers of FCF support the payment of FCF to bondholders through seven concepts. The concepts are early debt retirement, debt service, creditors, interest, bondholders, principal to

bondholders, and debt repayment. All of the payments decrease the a company's debt. If a company distributes some kinds of these payment from the FCF and does not distribute any kinds of stockholders from the FCF, the capital structure of a business changes in the route of equity increase. In this situation, debt/equity ratio decreases so financial risk decreases , and the financial cost decreases, anymore.

The writers of FCF support the payment of FCF to the business itself through five concepts. The concepts are merger and takeover, acquisition, some form of capital asset expansion, investment in other projects, and retained in the corporation. These group of FCF distribution does not affect the capital structure of a business. The first four concepts merger and takeover, acquisition, some form of capital asset expansion, and investment in other projects increases assets. The last concept retained in the corporation does not affect assets, liabilities and owner's equity. The FCF is not distributed to any investor groups. It is not invested to the assets. This sub-distribution concept retained in the corporation remains constant in equity of a business.This sub-group could be seen as an insurance by lost-averse investors of a business.

FCF Integration with CF Based Dividend Policy

FCF - CF Based Dividend Policy Integration

The opinions of Ferris et.al.(1992), Moyer et al. (1995), Verminnen (2005), Bekaert and Hodrick (2012), Palepu and Healy (2013), and Rupic et.al.(2017) about the distribution method of free cash flow to stockholders are shown at the Table 9 at below:

Table 9: Preference of FCF Payment Method to Stockholders

The Writer	Dividend payment to stockholders	Payment to stockholders through stock buyback
Ferris et.al.(1992)	----	X
Moyer et al. (1995)	X	----
Verminenn (2005)	X	X
Bekaert and Hodrick (2012)	X	X
Palepu and healy (2013)	X	X
Rupic et.al.(2017)	X	X

The Table 9 shows that the corporate finance literature accepting both dividend and stock buyback to pay the free cash flow are Verminnen (2005), Bekaert and Hodrick (2012), Palepu and Healy (2013), and Rupic et.al.(2017).

The four writers accept both two methods as a payment method to the shareholders. It means the one of them or the two of them could be used as a payment method to the shareholders. The tax and capital structure effects should be considered during the decision.

Ferris et.al.(1992) accept only stock buyback as a payment method of the free cash flow to the shareholders. Moyer et al. (1995) accept only dividend as a payment method of the free cash flow to shareholders.

The general rule is that dividend and/or stock buyback could be fulfilled only if there is a positive free cash flow created by a business. If there is no positive free cash flow or there is negative free cash flow, any dividend should not be paid or any stock buyback should not be fulfilled. In contrast, the financial manager should start to improve the business's free cash flow status immediately in order to pay dividend and/or to fulfill the stock buyback in the future.

If a business has positive free cash flow, it could pay it to the owners. Its owners are the stockholders only. This is interested in the dividend policy. The bondholders is not from the owners. The FCF could be paid as dividend and stock buyback in some amounts of FCF. The

mix depends on the management's opinions according to the conditions and advantages/disadvantages of the choices such as tax advantage /disadvantage.

Some writers does not separate payment kind/s for stockholders. They use more general concepts instead. This is shown at the Table 10 at below:

Table 10: Writers Using More General Concepts Instead of Dividend and/or Stock Buyback

To Whom/To What FCF Will Be Paid	The Writer	Number of the Writers
Owners	Keown et.al. (2005)	1
Shareholders	Vishwanath (2007), Ross et.al (2013), Bhandari and Adams (2017)	3
Common stockholders	Brigham and Houston (2009), Damodaran (2012)	2
Preferred stockholders	Brigham and Houston (2009), Damodaran (2012)	2
Investors	Brealey et al. (2011), Berk and DeMarzo (2017)	2

As it could be seen from the Table 10, some writers use a general concept to mean the payment from the FCF.

Keown et.al. (2005) uses the concept "owners". This means company owners. They are only stockholders. The bondholders are not included in the concept. They are long term creditors for the company.

Vishwanath (2007), Ross et.al (2013), and Bhandari and Adams (2017) use the concept shareholders.

Brigham and Houston (2009) and Damodaran (2012) use the concepts "common stockholders" and "preferred stockholders" differently to separate the payments to the two equity groups.

Brealey et al. (2011) and Berk and DeMarzo (2017) use more general concept. The concept is "investors".The concept covers debtholders in addition to the stockholders. However, this chapter's (that is the Chapter 6) subject is only stockholders. Only a group of investors, that is stockholders, is included in dividend policy.

Free Cash Flow to Equity (FCFE) – Dividend Policy Relationship

Even dividend policy could be thought a part of capital structure policy of a business, it should be considered that dividend policy is a special and different side of capital structure policy. Its reason is the dividend policy is for only equity owners (or owners of a business). For this reason, free cash flow to equity (FCFE) could be used as a tool to learn the questions "is there enough cash to pay to the equity owners ?" and " how much cash could be paid to the owners?".

Berk and DeMarzo (2017: 684) define free cash flow to equity (FCFE) as "FCFE is the free cash flow that remains after adjusting for interest payments, debt issuance, and debt repayment."

They calculate free cash flow to equity (FCFC) as follows:

$$FCFE=FCF-(1-T_c)\,x\,InterestPayments+Net\,Borroving \quad \text{.....(35)}$$

Damodaran (2012:344-345/949) defines free cash flow to equity (FCFE) as "the cash flows left over after meeting all financial obligations, including debt payments, and after covering capital expenditure and working capital needs.

He calculates free cash flow to equity (FCFE) as follows:

FCFE = Net income – (Capital expenditures – Depreciation) – (Change in noncash working capital) +(New debt issued -debt repayments) .....(36)

Bhandari and Adams (20179 calculate FCF as follows:

$FCF = CFO^{29}$ - *Capital Expenditure – Debt Payments*..... *(37)*

Because of debt payments were already shown in the FCF calculation method, the remaining amount should be paid only to the stockholders. That is, the writers actually think to pay the debtholders from the FCF. However, they pay before FCF was calculated.

Bhandari and Adams (2017) also noted before they show their FCF calculation method like that: "Until a consensus is developed, we recommend the following calculation of FCF". That is they are not sure that their FCF calculation method is enough to reflect the real FCF.

Moyer et.al (1995) calculates FCF as follows:

$FCF = CF - I^{30}(1\text{-}T) - Dp - Pf - B - Y$ .....*(38)*

Where**:**

CF: after-tax operating cash flow,
I: before- tax interest payment,
T: tax rate,
Dp: preferred stock dividend payment,
Pf: required redemption of preferred stock,
B: required redemption of debt,
Y: investment in property, plant and equipment required to maintain cash flows at their current levels.

Theit FCF calculation method already decreases interest and required redemption of debt. The result could be thought as FCFE to pay dividend and/or to buy back the common stock.

To apply the assumption given in the 2.1, it could be given a FCFE calculation method as follow:

FCFE= FCF – Net payments to debtholders..... (39)

FCF Integration with CF Based Valuation

Verminnen et.al.(2005), Brigham and Houston (2009), Brealey et.al.(2011), Damodaran (2012), Rupic et al. (2017), and Berk and DeMarzo (2017) discount free cash flows in valuation.

Verminnen et.al.(2005) say that a company's enterprise value is equal to the sum of its after-tax free cash flows discounted at the return required by shareholders and creditors (k or WACC). This is shown as follows:

Enterprise Value (EV) $=\sum^{\infty}_{t=0} FCFF_t/(1+k)^t$ ..... *(39)*

In here:

k or WACC: the return required by shareholders and creditors

Verminnen at.al.(2025) say that this formula assumes that free c40sh flows have been determined each year to perpetuity. They think that this is very hard so there are three

[29] The writers mean "operating cash flow" from the CFO because they have used CFO instead of cash flow from operations (CFFO) and operating cash flow in their article.
[30] The article says that if a firm has interest income, this is netted out against interest expense. If interest income exceeds interest expense, FCF will increase by the amount of the net after-tax interest income.

assumptions for this reason. They are zero growth in free cash flows, constant growth in free cash flows, and free cash flow rising at different rates over three periods.

Zero growth in FCF could be formulated as follows:

$$EV = FCFF/k \quad \text{.....(40)}$$

Constant growth[31] in FCF could be formulated as follows:

$$EV = FCFF_1/k-g=[FCFF_0\, x(1+g)]/k-g \quad \text{.....(42)}$$

Brigham and Houston (2009) say that a firm's value is determined by its ability to generate cash flow both now and in the future. The writers calculate market value of a company as follows:

Market Value of Company $= FCF_1/(1+WACC)^1 + FCF_2/(1+WACC)^2 + \ldots + FCF^{\infty}/(1+WACC)^{\infty}$ ..... (43)

In here,

FCFt :free cash flow in year t,

WACC:weighted averaged cost of all the firm's capital[32].

Brealey et.al.(2011) calculate the value of a business by discounting the value of its free cash flows out to a valuation horizon and adding it the forecasted value of the business at the horizon. Their formula to calculate the value of a business is as follows:

$$PV = [(FCF_1)/(1+r)] + [(FCF_2)/(1+r)^2] + \ldots + [(FCF_H)/(1+r)^H] + [(PV_H)/(1+r)^H] \quad \text{.....(44)}$$

In here;

r: discounting rate

FCF_H : horizon of FCFs

PV_H : horizon value

In here, the items

$$[(FCF_1)/(1+r)] + [(FCF_2)/(1+r)^2] + \ldots + [(FCF_H)/(1+r)^H] \quad \text{.....(45)}$$

calculate present value of free cash flows, and the item

$$[(PV_H)/(1+r)^H] \quad \text{.....(46)}$$

calculates present value of horizon value.

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[31]Verminnenn (2005) offers another method to calculate increasing cash flows at different rates over three different periods at the Verminnen (2005) as follows:

$$PV = F_1 x[1-(1+g_1)/(1+r)^{n_1}]/r-g_1 + (1+g_1)^{n_1-1}/(1+r)^{n_1} \; x \; (1+g_2)\, x\, [1-(1+g_2)/(1+r)^{n_2}]/r-g_2 + [(1+g_1)^{n_1} x$$

$$(1+g_2)^{n_2} x(1+g_3)]/(r+g_3)/(1+r)^{n_1+n_2}] \quad \text{.....(41)}$$

In here:
F_o : cash flow
F_1: $F_o(1+g)$
This method is offered for the FCF discounting. That is, PV means PV of FCF in his method.

[32] They assume that the firm is financed with debt, preferred stock, and common equity.

American Journal of Finance
ISSN 2520-0445 (Online)
Vol. 12, Issue 1, pp 64 - 86, 2026
www.ajpojournals.org

Damodaran (2012) says that a firm with free cash flows to the firm growing at a stable growth rate can be valued using as follows :

Value of Firm = $FCFF_1/(WACC-g_n)$.....*(47)*

where:

$FCFF_1$: Expected FCFF next year

WACC: Weighted average cost of capital

g_n: Growth rate in the FCFF forever

Damodaran caveats that there are two conditions that need to be met in using this model. The two condition are:

1. the growth rate used in the model has to be less than or equal to the growth rate in the economy. He says about when the nominal growth rate and real growth rate should be used during calculation of firm value. His opinion about this is like that: If the cost of capital is in nominal terms, nominal growth rate should be used. If the cost of capital is in real terms, real growth rate should be used.
2. the characteristics of the firm have to be consistent with assumptions of stable growth. In particular, the reinvestment rate used to estimate free cash flows to the firm should be consistent with the stable growth rate.

Damodaran (2012) says that the value of the firm can be written as the present value of expected free cash flows to the firm as follows:

Value of Firm=$\sum_{k=0}^{\infty} \sum FCFF_t / (1+WACC)^t$.....*(48)*

where;

$FCFF_t$: free cash flow to firm in year t

WACC: weighted average cost of capital

Damodaran (2012) adds another FCFF valuation method. He says if the firm reaches steady state after n years and starts growing at a stable growth rate g_n after that, the value of the firm can be written as follows:

Value of the Firm=$\sum_{t=1}^{t=n} [(FCFF_t/(1+WACC_{hg})^t] + [FCFF_{n+1}/(WACC_{st}-g_n)]/(1+WACC_{hg})^n$ .....(49)

where;

WACC : cost of capital (hg:high growth;st:stable growth)

Rupic et al. (2017) define the value of the firm is the present value of the expected future free cash flow to the firm discounted at the weighted average cost of capital (WACC). The firm value is calculated as follows:

Firm Value=FCFF /WACC.....*(50)*

The writers think that in the case of constant increase in free cash flow, the value of the firm between two periods is determined as follows:

Firm Value = $FCFF_1/(WACC-g)=[FCFF_0(1+g)]/(WACC-g)$.....*(51)*

where:
$FCFF_1$ – Expected Free Cash Flow to the Firm in One Year,
$FCFF_0$ – Starting Level of Free Cash Flow to the Firm,

g – Constant Expected Growth Rate in Free Cash Flow,
WACC – Weighted Average Cost of Capital

Berk and DeMarzo (2017) say that they forecast a firm's free cash flow up to some horizon, together with a terminal or continuation value of an enterprise is as follows:

$$V_0 = (FCF_1/(1+r_{wacc}) + (FCF_2/(1+r_{wacc})^2 + \ldots\ldots + (FCF_N + V_N{}^{33})/(1+r_{wacc})^N \quad (52)$$

Berk and DeMarzo (2017) say that often the terminal value is estimated by assuming a constant long-run growth rate (g_{FCF}) for free cash flows beyond the year N, so that

$$V_N = FCF_{N+1} / (r_{wacc} - g_{FCF}) = [(1+ g_{FCF}) / (r_{wacc} - g_{FCF})] \times FCF_N \quad (53)$$

The writers say that long-run growth rate g_{FCF} is typically based on the expected long-run growth rate of the firm's revenues.

The FCF discounting methods are shown at the Table 11 at below.

Table 11: Summary of FCF Discounting Methods

Method No.	The Writer	The Method
1a	Verminnen (2005)	$EV^{34} = \sum^{\infty}{}_{t=0} FCFF_t/(1+k)^t$
1b	Verminnen (2005)	$EV = FCFF/k$
1c	Verminnen (2005)	$EV = FCFF_1/k-g = [FCFF_0 \times (1+g)] / k-g$
2	Brigham and Houston (2009)	$MVC^{35} = FCF_1/(1+WACC)^1 + FCF_2/(1+WACC)^2 + \ldots + FCF^{\infty} / (1+WACC)^{\infty}$
3	Brealey et.al. (2011)	$PV^{36} = [(FCF_1)/(1+r)] + [(FCF_2)/(1+r)^2] + \ldots + [(FCF_H)/(1+r)^H] + [(PV_H)/(1+r)^H]$
4a	Damodaran (2012)	$VF^{37} = FCFF_1/(WACC-g_n)$
4b	Damodaran (2012)	$VF = \sum^{\infty}{}_{k=0} \sum FCFF_t/(1+WACC)^t$
4c	Damodaran (2012)	$VF = \sum^{t=n}{}_{t=1} \sum [(FCFF_t/(1+WACC_{hg})^t] + [FCFF_{n+1}/(WACC_{st}-g_n)]/(1+WACC_{hg})^n$
5a	Rupic et al. (2017)	$FV^{38} = FCFF/WACC$
5b	Rupic et al. (2017)	$FV = FCFF_1/(WACC-g) = [FCFF_0(1+g)]/(WACC-g)$
6	Berk and DeMarzo (2017)	$V_0 = (FCF_1/(1+r_{wacc}) + (FCF_2/(1+r_{wacc})^2 + \ldots\ldots + (FCF_N+V_N)/(1+r_{wacc})^N$

As it could be seen from the Table11, the discounting rates are selected in different forms. These are as follows:

[33] The V_N is calculated as follows:

$$V_N = FCF_{N+1}/(r_{wacc} - g_{FCF}) = [(1+ g_{FCF}) / (r_{wacc} - g_{FCF})] \times FCF_N \quad (54)$$

[34] EV means "Enterprise Value".
[35] MVC means "market value of company".
[36] In here, PV shows the total of future free cash flows and the horizon value together. In my opinion ,for this reason, It could be said PV of FCFs and HV .
[37] VF means "value of firm".
[38] FV means"firm value".

-The some writers have accepted weighted average cost of capital (WACC) as a discounting rate to calculate the value. They are Brigham and Houston (2009), Damodaran (2012), Rupic et al. (2017), and Berk and DeMarzo (2017). These represents 4/6 of the of the writers and 7/11 of the methods.

- Verminenn (2005) says that the FCF are discounted via the return required by shareholders and creditors (k or WACC). It could be thought that they mean WACC as a required rate of return.They use k as a shorten version of WACC.

- Brealey et.al. (2011) accept r as a discounting rate. They do not mean WACC with r.

As it could be seen from the Table 6, 5/6 of the writers accept WACC as discounting rate. This means 10/11 of the methods of the writers.This is very meaningful. This is cost of capital of the investors and they want at least the to get the costs back to decide the investment.

The methods for businesses of which free cash flows are endless could be qualified as perpetuity methods in valuation with FCF discounting.

-1b and 1b methods of Verminnen (2005), 4a method of Damodaran (2012), and 5a and 5b methods of Rupic et al. (2017) cover a perpetuity so their denominator do not cover any "1+" before their discounting rate.

-1a method of Verminnen (2005), Brigham and Houston (2009), Brealey et.al. (2011), 4a method of Damodaran (2012),and Berk and DeMarzo (2017) cover "n" period of FCFs and for this reason their denominator add "1+" before discounting rate. The FCFs could be different amounts or annuities in the "1+ discounting rate" denominator. The annuities are equal each other but their "n"s are different each year. For these calculations, there are some tables of "present values of $1" and "present value of annuity". These tables could be used for "1+ discounting rate" denominatored FCF based valuation calculation operations.

The growth rates of the FCFs are considered in the 1c method of Verminnen (2005), 4a and 4c methods of Damodaran (2012), and 5b method of Rupic et al. (2017).

Brealey et.al.(2011) and Berk and DeMarzo (2017) add the horizon value to their methods.

Conclusion

Cash flow based corporate finance (CFCF) model is an additional tool for corporate finance. In the model, cash flow insight is very important.

The free cash flow (FCF) insight could be thought as an additional sub-tool for the CFCF model. In my opinion, using FCF discounting in capital budgeting, merger acquisition, and valuation provides a useful additional instrument for the three functions of the model.

In addition to these three functions, FCF insight provides some other contributions to capital structure and dividend policy functions of the model. This contributions occur during the dividend payment and/or stock buyback decisions in dividend policy and during some adjustments in capital structure.

As a result, the integration of free cash flow with the CFCF model could improve the CFCF model.

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