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## Abstract

**Purpose:** To answer the question "why did not Yilmaz use available free cash calculation methods instead of his own FCF calculation method?

**Materials and Methods:** Firstly, the 23 FCF calculation method were determined. Secondly, they were grouped as to the financial statements they used to calculate FCF. Thirdly, the items used to calculate the FCF were analyzed for the two groups of the FCF calculation methods.

**Findings:** The all of FCF calculation methods are not suitable to be the numerator of Yilmaz ratio because of their missing or excess items or the inconsistency of them with the Yilmaz ratio's "denominator CFFO".

**Unique Contribution to Theory, Practice and Policy:** Yilmaz ratio should not be split as the numerator and the nominator. It is a whole. The two is exactly necessary items. People should not think that the one of the two items could be changed with another scientist' item or method.

**Keywords:** *Yilmaz Ratio's Numerator, CFFO, Capital Expenditures, Property, Plant, and Equipment Purchased via a M&A*

**JEL Code:** *G30, M41*

## INTRODUCTION

Yilmaz (2025) calculates "Yilmaz ratio" like that:

$$Yilmaz\ Ratio = \frac{CFF0 - Capital\ Expenditures\text{- }Property,\ Plant,\ and\ Equipment\ Purchased\ via\ a\ M\&A}{CFFO} \quad \ldots\ldots\ldots\ldots\ldots (1)$$

Yilmaz (2024:14) calculates free cash flow like that:

$$FCF = CFF0 - Capital\ Expenditures - Property,\ Plant,\ and\ Equipment\ Purchased\ via\ a\ M\&A \quad \ldots\ldots\ldots\ldots\ldots (2)$$

This shows that the numerator of Yilmaz ratio covers FCF calculation method created by Yilmaz (2024).

Yilmaz (2025) used Yilmaz (2024)'s FCF calculation method in Yilmaz ratio's numerator although there were many FCF calculation methods could have been used in Yilmaz ratio's numerator. They were developed from the year 1992 to the year 2017**.** They are shown at the Table 1 below.

**Table 1: FCF Calculation Methods Invented before Yilmaz (2024)'s FCF Calculation Method's Invention**

| Writer | Publishing Year | Writer | Publishing Year |
|---|---|---|---|
| Ferris et.al. | 1992 | Palpeu and Healy | 2013 |
| Moyer et.al | 1995 | Ivanovska et.al. | 2014 |
| Ross | 2003 | Subrahmanyam | 2014 |
| Keown et.al | 2005 | Kieso et al. | 2016 |
| Verminnen et.al | 2005 | Lewellen and Lewellen | 2016 |
| Richardson | 2006 | Ketz | 2016 |
| Vishwanath | 2007 | Stice et al. | 2017 |
| Brigham and Houston | 2009 | Rupic et. al. | 2017 |
| Brealey et.al. | 2011 | Bhandari and Adams | 2017 |
| Cornett et all | 2012 | Khatik and Patil | 2018 |
| Bekaert and Hodrick | 2012 | Adame et.al. | 2023 |
| Damodaran | 2012 | - | - |

None of the FCF calculation methods could not be used in the Yilmaz ratio's numerator. The question is "why did not Yilmaz use the available FCF calculation methods as his ratio's numerator"? There are some scientific and logical reasons not to be used the methods in the numerator. The reasons will be explained in this article.

While the subject is being explained, the FCF calculation methods will be grouped in two main groups. They are:

1. The methods starting to calculate FCF with income statement, and
2. The methods starting to calculate FCF with cash flow statement.

After the separation, the methods will be investigated in coordination with the properties of the financial statement they were included. The methods included in this article will be introduced in the sub-section 2.1. The sub-section 2.2. Discusses the reasons of not have been being used the methods as the numerator of Yilmaz ratio.

**Usability of Available FCF Calculation Methods as the Numerator of Yilmaz Ratio**

**The FCF Calculation Methods**

The FCF calculation methods are given below like that:

1. Ferris et.al. (1992:182) calculate the FCF like that:

*FCF= CFFO - Any Required Cash Disbursements in the Subsequent Periods……..* (3)

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. (1995:805) calculate the FCF like that:

$FCF = CF - I^{1}(1-T) - Dp - Pf - B - Y$…… (4)

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 (2003:37-38) calculates FCF like that:

*FCF= Operating Cash Flow – Net capital spending - Change in net working capital (NWC)*
…….. (5)

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

Ross at.al calculate the items they used like that:

*Operating Cash Flow= Earnings before interest and taxes (EBIT) +Depreciation – Taxes*
…… (6)

*Net capital spending = Ending net fixed assets - Beginning net fixed assets +Depreciation*
…… (7)

*Change in net working capital (NWC) = Ending net working capital (NWC)-Beginning net working capital (NWC)* …… (8)

4. Keown et.al (2005:45-46) calculate FCF like that:

[1] 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.

*FCF= after tax operating cash flows - investment in assets*…….…… (9)
They calculate "After tax operating cash flow" like that:
*After tax operating cash flow = Earnings before Interest Tax Depreciation and Amortization (EBITDA) –Cash Taxes* …… (10)
The writers calculate "Cash Taxes" like that: *Cash Taxes= Provision for income taxes – Change in income tax payable* …… (11)
The calculation of "Investment in assets" is done like that:

5. *Investment in assets= Change in net operating working capital + Change in gross fixed assets and other assets*…… (12)
   Verminnen et.al. (2005:481) calculate FCF like that:

*FCF*[2]*=EBIT (1-Tax rate) +Depreciation – Change in working Capital*[3] *-Net capital expenditure (Capex)* …… *(13)*

6. Richardson (2006:167) calculates FCF like that:

$$FCF = CF_{AIP} - I^*_{NEW} \quad \text{(14)}$$

In here:

$CF_{AIP}$: cash flow generated from assets in place,

$I^*_{NEW}$: expected new investment

The concept $CF_{AIP}$ is calculated like that:

$$CF_{AIP} = CFO - I_{MAINTENANCE} + RD^4 \quad \text{(15)}$$

In here:

CFO: Net cash flow from operating activities,

$I_{MAINTENANCE}$. Investment expenditure necessary to maintain in place.

RD: research and development expenditure

If the formula is integrated in only one formula, it could be adjusted like that:

$$FCF = CFO - I_{MAINTENANCE} + RD - I^*_{NEW} \quad \text{(16)}$$

It could be seen from the restructured formula that Richardson's calculation method actually starts with "Cash Flow Statement". In this article, this adjusted method will be used for practical purpose.

7. Vishwanath (2007:179) calculates FCF like that:

*FCF= Net Operating Profit After Tax (NOPAT) +Depreciation – Capital Expenditure – (+) Increases (Decreases) in Working Capital Investment* …… (17)
The writer calculates Net Operating Profit after Tax (NOPAT) like that:

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

[3] 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. More items are needed to reach "cash flow".

[4] Richardson (2006) thinks that CFAIP is estimated directly from the statement of cash flows by adding research and development expenditure back to operating cash flows. This is required because accounting standards force companies to expense research and development (RD) expenditure as such this amount is included as a deduction to operating cash flow. He says that financial economists usually consider that RD as discretionary investment expenditure.

*NOPAT= EBIT (1- tax rate)* …… (18)

The writer calculates the EBIT like that:

*EBIT= Revenue – Cost of goods sold –Operating expenses - Depreciation* …….. (19)

The writer thinks that the working capital investment should not be included cash and other equivalents. That is non-cash working capital is to be taken into consideration.

8. Brigham and Houston (2009:67) calculate FCF like that:

*FCF= EBIT (1-T) + Depreciation - [(Capital Expenditures +Increase in Net Working Capital)]* …… (20)

The writers calculate "Increase in Net Working Capital" that:

*Increase in Net Working Capital= Change in Current Assets – Change in Payables and Accruals* ……. (21)

9. Brealey et.al. (2011:90) calculate FCF cash flow as below:

*FCF= Earnings*[5] *– net investment* …… (22)

The writers calculate net investment like that:

*Net investment = Total capital expenditures – Depreciation* ……. (23)

10. Cornett et all. (2012:48) calculate FCF like that:

*FCF= [EBIT (1-Tax rate) +Depreciation] - [Change in Gross Fixed Assets +Change in Net Operating Working Capital]*…….. (24)

They separate the items to two main groups. These are "operating cash flow" and "investment in operating capital".

*FCF= Operating Cash Flow - Investment in Operating Capital* …… (25)

*Operating Cash Flow= EBIT (1-Tax rate) +Depreciation*…… (26)

*Investment in Operating Capital = Change in Gross Fixed Assets +Change in Net Operating Working Capital* ……. (27)

11. Bekaert and Hodrick (2012:524) calculate FCF like that:

*FCF= GCF – CAPX – ΔNWC* …… (28)

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

*GCF= NOPLAT (Net operating profit less adjusted tax) + Accounting Depreciation*…… (29)

The writers calculate NOPLAT like that:

*NOPLAT = EBIT – Taxes on EBIT*…… (30)

12. Damodaran (2012:369/949) calculates FCF like that:

*FCF*[6]*=EBIT (1-tax rate) +depreciation – capital*

*Change in working capital*…… (31)

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

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

13. Palpeu and Healy (2013:7-17) calculate FCF like that:

*FCF = EBIT*[7] *x (1-tax rate) + Depreciation and deferred taxes – Capital expenditures +/- increase/decrease in working capital* …… (32)

14. Ivanovska et.al. (2014:16) calculates FCF like that:

*FCF= NOPAT +Depreciation – CAPEX - Change in Net Working Capital*…… (33)

15. Subrahmanyam (2014:433) calculates FCF like that:

*FCF= Cash flows from operators – Net capital expenditures required to maintain productive capacity – Dividends on preferred stock and common stock (assuming a payout policy)* .. (34)

16. Kieso et al. (2016:222-223) calculate the FCF like that:

*FCF= Net Cash Provided by Operating Activities – Capital Expenditures – Cash Dividends*
…….. (35)

17. Lewellen and Lewellen (2016:1144) calculate FCF like that:

*FCF= Cash flow – capital expenditures*…… (36)

The writers calculate the "cash flow" like that:

*CF=IBC*[8]*+XIDOC*[9]*+DPC+TXDC+ESUBC+SPPIV +FOPO* …… (37)

The 7 items' meanings are shown as below:

IBC: income before extraordinary items

XIDOC: extraordinary items and "discontinued operations

DPC: depreciation and amortization

TXDC: deferred taxes

ESUBC: equity in net loss of unconsolidated subsidiaries

SPPIV: losses from the sales of Property Plant and Equipment (PPE)

FOPO: funds from operations (other

These items are explained in the Footnote 3 of Lewellen and Lewellen (2016:1141). The writers say that the all items come from Cash Flow Statement.

*18.* Ketz (2016: 48-49) calculates free cash flow like that:

*FCF=CFFO – Capital Investor sale ment - Property, plant, and equipment purchased via a M&A-Investment in Intangible assets*…… (38)

19. Stice et al. (2017:) calculate FCF like that:

*FCF= Operating Cash Flow - Capital Expenditures*…… (39)

20. Rupic at all (2017:) calculate FCF like that:

*FCF=NI+NCC*[10]*+Int x (1-Tax rate) -Inv (FC) -Inv (WC)*…… (40)

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[7] 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.

[8] Income before extraordinary items mean operating income It does not cover non-operating gains and cost.

[9] Discontinued operations mean some income or cost provided or incurred by not continued business. For instance, a cost incurred by a business for a product line saled or for sale is a cost for a discontinued product line. This should not be considered by investors because of not considering continuing operations of a business. This is not interested in investors or potential new investors.

[10] "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

In here:
NI: Net Income available to common shareholders
NNC: 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

21. Bhandari and Adams (2017:12) offer a calculation for FCF like that:

*FCF= CFO*[11] *- Capital Expenditure – Debt Payments*…….…….…..... (41)
In here, CFO means "Cash Flow from Operations".

22. Khatik and Patil (2018:111) calculate FCF like that:

*FCF*[12]*= Non-Operating Profit Less Adjusted Tax (NOPLAT) +Depreciation x tax rate +/- Fixed Capital Investment +/- Working Capital Investment +/- Change in Deferred Tax +/- post-tax non-operating cash flows …… (42)*

In here, NOPLAT is calculated like that:

*NOPLAT = EBITDA x (1-t) …… (43)*
Or
*NOPLAT = EBIT x (1-t) +non-cash expenses …… (44)*

23. Adame et. al. (2023:3) calculate FCF like that:

*FCF*[13]*= Operating cash flow (OCF) +Interest expense (1-tax rate) - Net capital expenditures*
*…….....(45)*

The writers calculate the "net capital expenditures "like that:

*Net capital expenditures = gross capital expenditures – proceeds from the sale of fixed assets*
……. (46)

**Usability of the Methods as the Numerator of Yilmaz Ratio**

**Financial Statements Used by the Available Methods 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 below.

show the cost of extracting natural resources from the earth. The 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. Deplation is for only the companies operating in natural sources industry. This does not mean that deplation 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.

[11] The writer means "operating cash flow" from the CFO because he has used CFO instead of cash flow from operations (CFFO) and operating cash flow in his literature review in his article.

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

[13] The writers say that operating cash flow and net capital expenditures are found from Cash Flow Statement and (pretax) interest expense is found in a footnote (in cash flow statement) or in Income Statement.

**Table 2: Financial Statements Used to Calculate FCF**

| Method no. | FCF Calculation Method | Cash Flow Statement | Income Statement | Balance heat |
|---|---|---|---|---|
| 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 | Richardson (2006) | + | +[14] | - |
| 7 | Vishwanath (2007) | - | + | + |
| 8 | Brigham and Houston (2009) | - | + | + |
| 9 | Brealey et.al. (2011) | - | + | + |
| 10 | Cornett et.al. (2012) | - | + | + |
| 11 | Bekaert and Hodrick (2012) | - | + | + |
| 12 | Damodaran (2012) | - | + | + |
| 13 | Palpeu and Healy (2013) | - | + | + |
| 14 | Ivanovska et.al. (2014) | - | + | + |
| 15 | Subrahmanyam (2014) | + | - | - |
| 16 | Kieso at. al. etz (2016) | + | - | - |
| 17 | Lewellen and Lewellen (2016) | + | - | - |
| 18 | Ketz (2016) | + | - | - |
| 19 | Stice et. al. (2017) | + | - | - |
| 20 | Rupic at. al. (2017) | - | + | + |
| 21 | Bhandari and Adams (2017) | + | - | - |
| 22 | Katik and Phatil (2018) | - | + | + |
| 23 | Adame et.al (2023) | + | - | - |

**Suitability of the FCF Calculation Methods to be used as Yilmaz Ratio's Numerator**

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

The FCF 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), Cornett et.al. (2012), Bekaert and Hodrick (2012), Damodaran (2012), Palpeu and Healy (2013), Ivanovska et.al. (2014), Rupic at. al. (2017), and Khatik and Patil (2018).

[14] Richardson's FCF calculation method covers "+RD" something like "+depreciation" covered by the the FCF calculation methods using income statement. Richardson (2006) thinks that CFAIP is estimated directly from the statement of cash flows by adding research and development expenditure back to operating cash flows. This is required because accounting standards force companies to expense research and development (RD) expenditure as such this amount is included as a deduction to operating cash flow. He says that financial economists usually consider that RD as discretionary investment expenditure.

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

**Table 3: "Cash Flow" Calculations of the Writers Use Income Statement to Calculate FCF**

| 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*[15] *NO ANOTHER ITEM TO ADD OR SUBTRACT* |
| Cornett et.al. (2012) | EBIT (1-Tax rate) +Depreciation |
| Bekaert and Hodrick (2012) | NOPLAT (Net operating profit less adjusted tax) + Accounting Depreciation |
| Damodaran (2012) | EBIT (1-tax rate) +depreciation |
| Palpeu and Healy (2013) | Earnings before interest and taxes x (1-tax rate) + Depreciation and deferred taxes |
| Ivanovska et.al. (2014) | NOPAT +Depreciation |
| Rupic et.al (2017) | NI+NCC+Int x (1-Tax rate) |
| Katik and Phatil (2018) | Non-Operating Profit Less Adjusted Tax (NOPLAT) +Depreciation x tax rate |

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 Table3, 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. Verminnen et.al. (2005), Brigham and Houston (2009), Cornett et.al. (2012), Damodaran (2012), and Palpeu 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 Ivonovskaet.al. (2014) and LAT (less adjusted tax) of NOPLAT in Beakard 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 (Rupic at.al.:2017:77) 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."

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

Khatik and Patil (2018) calculate NOPLAT like that:

$$NOPLAT = EBITDA \times (1-t) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (47)$$

That is, the writers the tax calculates earning, interest, depreciation and amortization altogether through multiplying (1-t). Brealey et.al. (2011) calculates 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.

All of these FCF calculation methods is not enough to become the Yilmaz ratio's numerator. As a structural, 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 items not included to cash flow if income statement is preferred to calculate cash flow determining are[16]:

i. Amortization except Keown et.al (2005),
ii. Provision for losses on accounts receivable,
iii. Increase in accounts receivable,
iv. Decrease in inventory,
v. Increase in prepaid expenses,
vi. Decrease in accounts payable and accrued expenses,
vii. Increase in interest and income taxes payable,
viii. Increase in deferred taxes except Palpeu and Healy (2013).

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

[16] 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 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 |
| Palpeu and Healy (2013) | +/- increase/decrease in working capital |
| Rupic at. al. (2017) | -Inv (WC)[17] |
| Ross et.al. (2003), Bekaert and Hodrick (2012)[18], and Ivanowska et.al (2014) | Change in net working Capital |
| Keown et.al. (2005) and Cornett et.al. (2012)[19] | Change in net operating working Capital |
| Brigham and Houston (2009) | Increase in Net Working Capital[20] |
| Katik and Phatil (2018) | +/- Working Capital Investment |
| Brealey et.al. (2011) | *NO WORKING CAPITAL ITEM TO ADD OR SUBTRACT* |

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

i. The methods adopting gross working capital[21],
ii. The methods adopting net working capital[22]

The methods adopting working capital are Verminen et.al. (2005), Damodaran (2012), Vishwanath (2007), Palpeu and Healy (2013), Rupic at. al. (2017), and Katik and Phatil (2018). The methods adopting net working capital are Ross et.al. (2003), Bekaert and Hodrick (2012), Ivanowska et.al (2014), Keown et.al. (2005), Cornett et.al. (2012), and Brigham and Houston (2009). Verminen at.al. (2005:481) 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". All right, do other income statement based FCF calculation methods writers think same or not? Let's look at the Table 5 below.

[17] The writers explain it as "Inv (WC): Investment in Working Capital".
[18] The writers actually use a shortened version ΔNWC and they explain it as "Change in net working Capital".
[19] The writers actually use the term in brachets like that: …. - [Change in Gross Fixed Assets +Change in Net Operating Working Capital]. This writer multiplies mines (-) written before the bracket and plus (+) written in the bracket. As a result, he separates the "-Change in net working Capital "and uses it in this table.
[20] The writers actually use the term in brachets like that: …. - *[(Capital Expenditures + Increase in Net Working Capital)]*. This writer multiplies mines (-) written before the bracket and plus (+) written in the bracket. As a result, he separates the "- *Increase in Net Working Capital*" and uses it in this table.
[21] It means a corporate's current assets.
[22] It means a corporate's "current assets – current liabilities".

**Table 5: Priority of Working Capital and Capital Investment**

| Method | Priority of Working Capital and Capital Investment |
|---|---|
| Ross at. al. (2003) | Net capital spending - Change in net working capital (NWC) |
| Keown et.al. (2005) | Investment in assets [23] |
| Verminnen et.al. (2005) | Change in working Capital -Net capital expenditure (Capex) |
| Vishwanath (2007) | Capital Expenditure – (+) Increases (Decreases) in Working Capital Investment |
| Brigham and Houston (2009) | [(Capital Expenditures +Increase in Net Working Capital)] |
| Brealey et.al. (2011) | Net investment[24] |
| Cornett et.al. (2012) | [Change in Gross Fixed Assets + Change in Net Operating Working Capital] |
| Bekaert and Hodrick (2012) | CAPX[25] – ΔNWC[26] |
| Damodaran (2012) | Capital expenditure – change in working capital |
| Palpeu and Healy (2013) | Capital expenditures +/- increase/decrease in working capital |
| Ivanovska et.al. (2014) | CAPEX - Change in Net Working Capital |
| Rupic at. al. (2017) | Inv (FC)[27] -Inv (WC) |
| Katik and Phatil (2018) | +/- Fixed Capital Investment +/- Working Capital Investment |

As it could be seen from the Table 5**,** Ross at. al. (2003), Vishwanath (2007), Brigham and Houston (2009), Cornett et.al. (2012), Bekaert and Hodrick (2012), Damodaran (2012), Palpeu and Healy (2013), Ivanovska et.al. (2014), Rupic at. al. (2017), and Katik and Phatil (2018) start decreasing assets from "cash flow" with fixed capital, not working capital. This means they do not consider working capital the way to reach cash flow. They think about fixed assets as the first thing to decrease from cash flow.

Other than Verminen et.al (2005), only Keown et.al. (2005) start with *"*Change in net operating working capital" to their "investment in assets". This Table shows the invalidity of Verminen et.al. (2005)'s opinion about working capital's being a complementary item of "cash flow".

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[28], the cash flow is reached.

[23] The writers explain it like that:
*Investment in assets= Change in net operating working capital + Change in gross fixed assets and other assets*
[24]The writers calculate net investment like that:
*Net investment = Total capital expenditures – Depreciation*
[25] CAPX: Capital expenditures
[26] ΔNWC: Change in net working capital
[27] Inv (FC): Investment in Fixed Capital

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

**Methods Using Cash Flow Statement**

The FCF methods using cash flow statement to calculate FCF are Ferris et.al. (1992), Moyer et.al (1995), Richardson (2006), Subrahmanyam (2014), Kieso at. al. (2016), Lewellen and Levellen (2016), Ketz (2016), Stice et. al. ((2017), Bhandari and Adams (2017), and Adame et.al (2023). These writers used only cash flow statement to calculate FCF.

**A Method Considering "Cash Flow" instead of "CFFO"**

Lewellen and Levellen (2016) used "cash flow" during their FCF calculation. It does not fit the denominator, CFFO, of Yilmaz ratio. Yilmaz used CFFO in his ratio's numerator and denominator. Reciprocity was very important for Yilmaz's ratio so he eliminated this method.

**A Method Considering "After Tax CFFO"[29]**

Moyer et.al (1995) used "after tax CFFO" during their FCF calculation. It means "CFFO-Tax". It does not fit the denominator of Yilmaz ratio because it is only "CFFO". There is no reciprocity between (CFFO-Tax) in the numerator if it is accepted and Yilmaz ratio's denominator FCFF.

**The Methods Considering CFFO instead of Cash Flow**

Ferris et.al. (1992), Richardson (2006), Subrahmanyam (2014), Kieso at. al. (2016), Ketz (2016), Stice et. al. (2017), Bhandari and Adams (2017), and Adame et.al. (2023) used CFFO or similar concept during their FCF calculations. The all concepts used as a first item to calculate FCF are shown at the Table 6 below.

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

| Writer/s and Year | The First item |
|---|---|
| Ferris et.al. (1992) | CFFO |
| Richardson (2006) | CFO[30] |
| Subrahmanyam (2014) | Cash flows from operations |
| Kieso at. al. (2016) | Net Cash Provided by Operating Activities |
| Ketz (2016) | CFFO |
| Stice et. al. (2017) | Operating Cash Flow |
| Bhandari and Adams (2017), | *CFO* |
| Adame et.al. (2023) | *Operating cash flow (OCF)* |

The eight writers (or groups of the writers) used the concept for same meaning like Yilmaz ratio. The main idea of the concepts in the six methods and Yilmaz ratio are the same. The concepts mean that the cash has been produced by a company, exactly. For this reason, from the point of reciprocity of Yilmaz ratio's denominator CFFO, all of they are suitable. Yilmaz already used this concept as a first item of his (Yilmaz, 2024) FCF calculation method. There is no any problem by this point. However, after the CFFO or similar concepts, the six writers use very different items to calculate FCF. "After CFFO" items are shown at the Table 7 below.

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

[30] If the formula is integrated in only one formula, it could be adjusted like that:

$$FCF = CFO - I_{MAINTENANCE} + RD - I^*_{NEW}$$

CFO is the first item of the integrated method of Richardson.

**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 |
| Richardson (2006)[31] | $I_{MAINTENANCE}$ +RD – $I^*_{NEW}$ |
| Subrahmanyam (2014) | Net capital expenditures required to maintain productive capacity<br>Dividends on preferred stock and common stock (assuming a payout policy) |
| Kieso at. al. (2016) | Capital Expenditures, Cash Dividends |
| Ketz (2016) | Capital Investment, Property, plant, and equipment purchased via a M&A-Investment in Intangible assets |
| Stice et. al. (2017) | Capital Expenditures |
| Bhandari and Adams (2017) | *Capital Expenditure – Debt Payments* |
| Adame et.al. (2023) | *+Interest expense (1-tax rate)- Net capital expenditures* |

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 numerator of Yilmaz ratio. In Yilmaz ratio, the numerator, which is Yilmaz's (2014) own FCF calculation method, is very clear and all of the items used in the ratio could be found from the cash flow statement, exactly.

Richardson (2006)'s integrated formula covers "– $I_{MAINTENANCE}$ "and "– $I^*_{NEW}$" in its coverage. The two items are the two parts of capital expenditures in addition to the RD after the CFO. The RD is an item not working in all businesses, generally. It could be thought as not very important item as amount. The decreasing amount almost as capital expenditures. However, Yilmaz ratio covers Yilmaz's own FCF calculation method it covers "capital expenditures via M&A" in addition to the regular "capital expenditures" to decrease from CFFO. This could be thought as an innovation.

Subrahmaniam (2014) decreases dividends on preferred stock and common stock from CFFO in addition to capital investment. He does not consider capital investment via M&A. Yilmaz (2024) does not think that dividend payment is a strategic cash flow. That is an ordinary cash flow from financing (CFFA), not from operating cash flow (CFFO) which is Yilmaz ratio's main concept.

Kieso et.al. (2016) subtracted capital expenditures and cash dividends from Net cash provided by operating activities. If the FCF is for all the company, "why did they subtract only cash dividend? Is there any debt (accounting payable) interest payment and was it paid? It is more dangerous because of bankruptcy laws. Of course, this could be checked from cash flow statement.

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.

[31] If the formula is integrated in only one formula, it could be adjusted like that:

$$FCF = CFO - I_{MAINTENANCE} + RD - I^*_{NEW}$$

The "– $I_{MAINTENANCE}$", "+$RD$", *and* "– $I^*_{NEW}$" *are* the non-CFO items of the integrated method of Richardson.

Ketz (2016) considers "investment in intangible assets" such as goodwill, R&D to subtract from CFFO. These is not as important as amount generally and many companies have not this item so it could be thought as inconsiderable to subtract from CFFO. For this reason, this writer (Yilmaz) did not accept Ketz's FCF calculation method for his (Yilmaz's) ratio's numerator. However, Yilmaz (2024) considered Ketz's another item he used to calculate FCF. This item is "Property, plant, and equipment purchased via a M&A". Yilmaz accepted this item and benchmarked it for his FCF calculation method as a third item (Yilmaz 2024:14). Stice et.al. (2017) consider only capital expenditures to subtract from operating cash flow to calculate FCF. Yilmaz thinks that it is missing because of it is not covering "capital expenditures via M&A".

Bhandari and Adams (2017) consider not only capital expenditure but also debt payments to subtract from CFO. Yilmaz ratio does not think and does not accept to subtract "debt payments" from CFO because it take the concept FCF to the concept FCFE (free cash flow for equity). However, they think their calculation is FCF[32].

Adame et.al. (2023) add after tax interest expense before decreasing net capital expenditures. This means "Before after-tax interest CFFO". This is not all interest expense. The interest includes only non-tax part of it. As it could be seen, it is not suitable to become the numerator because the denominator of Yilmaz ratio is "CFFO".

It could be said that none of these available cash flow statement based "starting with CFFO" FCF calculation methods meets Yilmaz ratio's numerator requirement because of Yilmaz's "broader capital investment perspective" covering capital investment via M&A, too.

## CONCLUSION AND RECOMMENDATIONS

### Conclusion

Yilmaz (2025) decided to use his own FCF calculation method given in Yilmaz (2024) in his ratio's numerator. Anymore, there is no doubt about "will which calculation method be used to calculate FCF?" The numerator of Yilmaz ratio is Yilmaz (2024)'s FCF calculation method. It is shown like that:

*CFF0 - Capital Expenditures - Property, Plant, and Equipment Purchased via a M&A .... (48)*

This article also shows the reason of Yilmaz's giving his surname to his ratio. If Yilmaz preferred one of the available FCF calculation method, he not used to give his surname to his ratio. None of the FCF calculation methods rather than Yilmaz (2024)'s FCF calculation method represents the Yilmaz ratio's numerator. If someone uses to calculate Yilmaz ratio using the anyone of all other FCF calculating methods, included or not included in this article, rather than Yilmaz's own FCF calculation method, this will not be "Yilmaz ratio" because the Yilmaz ratio is a whole with its numerator and denominator and cannot be broken down.

After all explanations and discussion, Yilmaz ratio could be redefined like that:

Yilmaz ratio is a free cash flow ratio of which numerator covers Yilmaz (2024)'s free cash flow (FCF) calculation method.

In this article, the numerator of Yilmaz ratio has been finalized. A ratio has a numerator rather than "CFF0 - Capital Expenditures - Property, Plant, and Equipment Purchased via a M&A" is not Yilmaz ratio. If Yilmaz ratio's numerator is compared with the potential numerator candidates Ferris et.al. (1992), Ross at. al. (2003), Keown et.al. (2005), Verminnen et.al. (2005), Richardson (2006), Vishwanath (2007), Brigham and Houston (2009), Cornett et.al.

[32] Bhandari and Adams (2017:16) 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 FCFF are true concepts for FCF covering all business with all financing sources.

(2012), Bekaert and Hodrick (2012), Damadoran (2012), Palpeu and Healy (2013), Ivanovska et.al. (2014), Subrahmanyam (2014, Kieso at. al. (2016), Lewellen and Lewellen (2016), Ketz (2016), Stice et. al. (2017), Rupic at. al. (2017), and Khatik and Patil (2018), it could be seen that Yilmaz ratio's numerator Yilmaz (2024) covers all capital investment including capital investment and capital investment via M&A.. The all of the other potential numerator candidate FCF calculation methods except Ketz (2016)[33] given above do not cover "capital investment via M&A".

**Recommendations**

As it could be said, Yilmaz (2005), true Yilmaz ratio[34] could be an important financial tool for corporates and investors. If the ratio is under the average, the corporation has more capital investment than the other companies. The word "under" has been selected consciously. Its reason is FCF's decreasing with capital investments. Its explanation is like that: If capital investment increase FCF decrease, it means that the numerator of Yilmaz ratio decreases. As a result, the Yilmaz ratio decreases. This is good for investors and corporations. It is also important for companies and investors because these capital investments are financed through the company's homemade cash, CFFO. The bigger Yilmaz ratio means the smaller capital investment and the smaller Yilmaz ratio means the bigger capital investment. If it is considered that the capital investments cover all capital investments including traditional capital investment and capital investment through M&A, it could be seen that Yilmaz ratio with the numerator Yilmaz's (2024) coverage is truer measurement for investors and corporations to see a corporation's free cash flow financed via the cash a Corporation produced or created itself.

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[33] His FCF calculation method covers capital investment via M&A". However, Ketz (2016) considers "investment in intangible assets" such as goodwill, R&D to subtract from CFFO. These is not so important as amount generally and many companies have not this item so it could be thought as inconsiderable to subtract from CFFO. For this reason, this writer (Yilmaz) did not accept Ketz's FCF calculation method for his (Yilmaz's) ratio's numerator.

[34] It means" a Yilmaz ratio of which numerator exactly covers Yilmaz (2024) coverage.

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