American Journal of
Finance
(AJF)

Yilmaz Ratio

Prof. Dr. Huseyin Yilmaz

American Journal of Finance
ISSN 2520-0445 (Online)
Vol. 11, Issue 1, pp 1 - 23, 2025
www.ajpojournals.org

Yilmaz Ratio

Prof. Dr. Huseyin Yilmaz

Department of Finance and Accounting, Faculty of Economics and Administrative Sciences, Bilecik Şeyh Edebali University, Bilecik, Turkey

Article history

Submitted 10.01.2025 Revised Version Received 14.02.2025 Accepted 03.03.2025

Abstract

Purpose: Yilmaz Ratio is "CFFO- Capital Expenditures-Property, Plant, and Equipment Purchased via a M&A: CFFO". However, this is the last and valid version of Yilmaz Ratio.

Materials and Methods: Actually, it started to be created by Yilmaz (2021) during his article investigating the usage possibility of Free Cash Flow (FCF) concept in corporate finance. It was evolved in Yilmaz (2022) during the creation of cash flow based corporate finance (CFCF) model.

Findings: The most important change was realized in Yilmaz (2024b) during the explanation of dividend policy function of the model. This is the Yilmaz ratio given above in the Abstract.

Implications to Theory, Practice and Policy: It was used during free cash flow based corporate finance (Yilmaz,2021) and dividend policy function of cash flow based corporate finance (CFCF) model (Yilmaz, 2024b). It also could be used in cash management of working capital management and financial investment decisions etc. Potential other usage fields will be searched in future.

Keywords: *Yilmaz Ratio, Free Cash Flow, CFFO, Capital Expenditures, Property, Plant, and Equipment Purchased via a M&A.*

JELCode: G30

American Journal of Finance
ISSN 2520-0445 (Online)
Vol. 11, Issue 1, pp 1 - 23, 2025
www.ajpojournals.org

INTRODUCTION

Yilmaz (2024b:14) says about the change of "Yilmaz Ratio" calculation method like that: "It is not the same as the calculation method of Yilmaz (2021) because this writer changed his opinion about his free cash flow calculation method given in Yilmaz (2021). Its reason is not this article's subject. It will be explained in another article by this writer in the near future."

This is the article Yilmaz (2024b) writes. There is no consensus about Yilmaz Ratio's numerator "free cash flow" calculation methods in the finance literature.

In this article, the arising, evolution, and usage of the Yilmaz Ratio will be explained in the Chapter 2 and the Chapter 3.

Additional detailed information and comparisons about not accepted and abandoned potential numerators of Yilmaz ratio the free cash flow will be given in another article. Even why was the title of this ratio given as Yilmaz will be explained in the future article because there are no consensus about free cash flow calculation in the finance literature.

Finance textbooks cover many ratios calculated via balance sheet and income statement. Yilmaz ratio is calculated using only cash flow statement. Actually, it is a part of Group A cash flow ratios being used in CFCF model could be seen the resource list of this article. The source cover 30 cash flow ratios in three groups.

Yilmaz Ratio

Evolution Stages of Yilmaz Ratio

Stage I: Arising of Yilmaz Ratio

Arising of the Numerator of the Ratio

Yilmaz (2021:86) says about the calculation of the numerator "Free Cash Flow" of Yilmaz Ratio like that:

"I have a different method to calculate free cash flow than those of methods shown above[1]. This method is shown as below:

Free Cash Flow= Increase /(Decrease) in Cash, Cash Equivalents, and Restricted Cash

– Capital Expenditures

The free cash flow in my free cash flow calculation method covers two main items.

They are "Increase /(Decrease) in Cash, Cash Equivalents, and Restricted Cash" and "Capital Expenditures". They could be found from the cash flow statement.

"Increase /(Decrease) in Cash, Cash Equivalents, and Restricted Cash" could be calculated like that:

[1] The free cash flow calculation methods shown above (This term was used in Yilmaz (2021)) are Jensen (1986), Moyer et.al. (1995), Ross et.al (2003), Keown et.al. (2005), Richardson (2006), Lewellen and Lewellen (2016), Stice at.al (2017), Bhandari and Adams (2017), and Rupic at al. (2017). This footnote was prepared by Yilmaz during the preparation of this (Yilmaz,2025) article.

Increase /(Decrease) in Cash, Cash Equivalents, and Restricted Cash = Cash, Cash Equivalents, and Restricted Cash, Ending Balances – Cash, Cash Equivalents, and Restricted Cash, Beginning Balances

To calculate "Increase /(Decrease) in Cash, Cash Equivalents, and Restricted Cash", cash flow statement is used. No other financial statement is required for this purpose. However, to check the number, we could compare a number in the balance sheet. The number is the account "Cash and Cash Equivalent" in the current assets. We need two numbers in the two balance sheets of the business. They are the former year's balance sheet and the current year's balance sheet. Difference between the two year's "cash and cash equivalent" account is the current year's cash flow of the company.

A footnote is given to explain "Cash and Cash equivalent" in the footnote 10 in the page 86 like that:

"The account "cash and cash equivalent" covers the components cash, restricted cash, and cash equivalent. The component "cash" covers currency, coins, bank overdraft, cash in saving account, cash in checking account, money order, and petty cash. The restricted cash covers "restricted cash in other current assets" and "restricted cash in other noncurrent assets". The cash equivalents cover treasury bill, commercial paper, marketable securities, money market fund, and short-term government bond."

The concepts used to calculate the numerator of the Yilmaz Ratio are:

1. Increase /(Decrease) in Cash, Cash Equivalents, and Restricted Cash[2]
2. Capital Expenditures
3. Cash, Cash Equivalents, and Restricted Cash, Ending Balances
4. Cash, Cash Equivalents, and Restricted Cash, Beginning Balances

All of the four items could be found from the Cash Flow Statements suitable to the Form 10-K. The two of them, that is, "Cash, Cash Equivalents, and Restricted Cash, Ending Balances" and "Cash, Cash Equivalents, and Restricted Cash, Beginning Balances" could be used to check the numerator of Yilmaz Ratio, FCF, "Increase /(Decrease) in Cash, Cash Equivalents, and Restricted Cash".

Arising of the Denominator and Yilmaz Ratio

Arising of the Denominator and the Full Ratio is explained in Yilmaz (2021:88) like that:

"Free cash flow could be compared some company data to do some meaningful comments. For instance, it could be a denominator[3] of total cash produced. We can write it like that:

[2] Restricted cash refers to money that is held for a specific purpose and thus not available to the company for immediate or general business use (investopedia.com/terms/r/restricted-cash.asp).

[3] It was written as "nominator" in Yilmaz (2021), wrongly. In this article (Yilmaz (2025), its true writing "denominator" was used.

$$\text{Yilmaz Ratio}^{4} = \frac{\textit{Free Cash Flow}}{\textit{Cash flow}} \qquad (1)$$

For example, the Apple Inc. has created $24,311 cash flow in the year 2019. Its free cash flow was $13,816 in the same year. We calculate the Free Cash Flow to Cash Flow for the Apple Corp. like that:

FCFCF= 13,816 /24,311= 0.5683

It means that the company has produced 56.83% free cash from its cash flow. It could also be said that its cash flow's 56.83% is free cash flow. After separating its capital expenditure to survive, it has still cash 56.83% of its cash flow."

The citation from Yilmaz (2021:88) shows that:

1. the name of ratio was "Free Cash Flow to Cash Flow". It looks like as if the ratio is already given in the title. The meaning of the ratio is the rate of free cash flow to cash flow.
2. the denominator of the ratio is "cash flow", not cash flow from operations (CFFO). It means that
3. the denominator uses net of cash flow from operations (CFFO), cash flow from investing activities (CFFI), and cash flow from financing activities (CFFF). It does not show the produced cash. On the contrary, it shows the remains of produced, financed, and invested cash. It is very tidy concept.
4. in the denominator, a theoretical concept which is "cash flow" was used instead of a FAS 5 10-K concept used in Yilmaz (2021:86) "Increase /(Decrease) in Cash, Cash Equivalents, and Restricted Cash". Actually, their meanings are same. The two of them means "cash flow". Its plainer explanation is that the U.S. accounting system uses "Increase /(Decrease) in Cash, Cash Equivalents, and Restricted Cash" instead of "cash flow" in its Financial Accounting Standards (FAS). Yilmaz (2021:86) used the concept "Increase /(Decrease) in Cash, Cash Equivalents, and Restricted Cash" in calculating free cash flow which is the numerator of Yilmaz Ratio.

It is an inconsistency to use different concepts for the same meaning. However, the two concepts were used in different sub-chapters. The concept "Increase /(Decrease) in Cash, Cash Equivalents, and Restricted Cash" was used in the sub-chapter II.B. A New Free Cash Flow Calculation Method and an Application at the p. 86. The concept "cash flow" was used in III.A. Financial Analysis at the p.88. Actually, it could be said that the 10K concept was converted into a theoretical concept

---

The name or title of the first stage of Yilmaz Ratio was "Free Cash Flow to Cash Flow". In this article (Yilmaz, 2025) the title Yilmaz Ratio has been used for the publicity of the new title Yilmaz Ratio. It could be written numerator detailed like that:

$$\textit{Yilmaz Ratio} = \frac{\textit{Cash Flow} - \textit{Capital Expenditures}}{\textit{Cash Flow}} \qquad (2)$$

"cash flow" in the same article at the next sub-chapter and the next chapter after 2 pages (88-86=2). By integrating Yilmaz (2021:86) and Yilmaz (2021:88), the detailed calculation of free cash flow ratio could be fulfilled like that:

The Apple Corporation's Year 2019 free cash flow was calculated like that:

(Increase /(Decrease) in Cash, Cash Equivalents, and Restricted Cash:	24,311[5]
- Capital Expenditures:	10,495
=Free Cash Flow	13,816

Yilmaz Ratio could be calculated numerator detailed using cash flow statement (Apple 2019) like that:

$$Yilmaz\ Ratio = \frac{(Increase/(Decrease)\ in\ Cash,\ Cash\ Equivalents,\ and\ Restricted\ Cash - Capital\ Expenditures}{(Increase/(Decrease)\ in\ Cash,\ Cash\ Equivalents,\ and\ Restricted\ Cash} \quad (3)$$

The Apple's Yilmaz Ratio (2019) =

= (24,311- 10495):24,311

=13,816: 24,311

=0.5683

=% 56.83

[5] This number could be checked from the cash flow statement like that:

"Cash, Cash Equivalents, and Restricted Cash,

Ending Balances": 50,224

- "Cash, Cash Equivalents, and Restricted Cash, Beginning Balances": 25,913

= "Increase /(Decrease) in Cash, Cash Equivalents, and Restricted Cash": 24,311

Stage 2: The First Evolution

Change of Denominator

Yilmaz (2022:11) calculated the Yilmaz Ratio like that:

$$\textit{Yilmaz Ratio}^{6} = \frac{\textit{Free Cash Flow}}{\textit{CFFO}} \quad (4)$$

This ratio could be calculated as numerator detailed like that:

$$\textit{Yilmaz Ratio} = \frac{\textit{Cash Flow- Capital Expenditures}}{\textit{CFFO}} \quad (5)$$

Yilmaz (2022) provides an application of the firstly evolved Yilmaz ratio.

The Apple's First Evolved Yilmaz Ratio (2022) could be calculated numerator detailed using cash flow statement (Apple 2019) like that:

$$\textit{(Increase/(Decrease) in Cash, Cash Equivalents, and Restricted Cash-Capital Expenditures Yilmaz Ratio} = \frac{}{\textit{CFFO}} \quad (6)$$

The Apple's First Evolved Yilmaz Ratio (2019) was calculated in Yilmaz (2022:12) like that:
The Apple's First Evolved Yilmaz Ratio (2019):

= (24,311- 10495): 69,391

=13,816: 69,391

=0.1991

= %19.91

The ratio changed from 56.83% to 19.91%. It is a decrease about 64.97%. The ratio is about 1:3 of the former (2021) ratio. Its reason is the change of the denominator. In Yilmaz (2022), the denominator is CFFO instead of "cash flow". While the denominator was 24,311 in Yilmaz (2019), it was 69,391 in Yilmaz (2022). Amount of the denominator increased and the amount of ratio decreased, mathematically, because of not increasing the numerator of the ratio.

There was an interesting situation in Yilmaz (2022) ratio. Its denominator is exactly different from its two items placing its numerator. This subject was investigated in the next chapter and improved there in the context of the numerator because the writer is sure from his denominator given in Yilmaz (2022) ratio.

[6] Actually, the title or name of this ratio in Yilmaz (2022) was "Free Cash Flow Ratio". For the sake of publicity, the title Yilmaz Ratio has been used in this article, the Yilmaz,2025).

The Reason of Change of the Denominator

The denominator was "cash flow" in Yilmaz (2021). However, "cash flow" and "operating cash flow" are different concepts. They are very different from the each other.

The operating cash flow or cash flow from operations (CFFO) covers the cash flow a business creates through its own operations, not financing and investment activities. However, the "cash flow" covers the net of all three cash flow groups of operating, financing, and investing activities. This is very important difference. Its reason is "cash flow" opinion is a complementary or an alternative way to the concept "profit" to measure the success of a business. Profit (except non-operating revenues) is created by operating activities so the alternative "cash flow" should also be created by operating activities.

The First Appearance of a Definition of "Cash Flow"

Yilmaz (2022) explains the ratio like that:

"It shows the proportion of free cash flow in CFFO. It means a business produces how percentage[7] of its operating cash flow as a free cash flow. To compare with other companies, this ratio is more useful than the amount of free cash flow."

This shows that Yilmaz Ratio is defined first time verbally. Its definition is that "Yilmaz Ratio is a ratio that shows a business produces what percentage of its CFFO as a free cash flow".

Yilmaz (2021) does not give any definition so this could be though as an evolution of Yilmaz (2021).

Stage III: The Second Evolution

Change of the Numerator

Yilmaz (2024b:12) shows free cash flow ratio like that:

$$Yilmaz\ Ratio\ ^{8} = \frac{Free\ Cash\ Flow}{CFFO} \qquad (7)$$

Even though the numerator Free Cash Flow seems same as Yilmaz (2022) ratio, the calculation of the numerator of the ratio in Yilmaz (2024b) has been changed. The free cash flow is calculated in Yilmaz (2024b:14) like that:

FCF= CFFO- Capital Expenditures-Property, Plant, and Equipment Purchased via a M&A

[7] I think that it should be "what percentage".

[8] Actually, the title or name of this ratio in Yilmaz (2024b.12 and 14) was "Free Cash Flow Ratio". For the sake of publicity, the title Yilmaz Ratio has been used in this article, the Yilmaz,2025).

If the two parts, numerator and denominator, are integrated, the Yilmaz Ratio could be shown like that:

$$Yilmaz\ Ratio = \frac{CFF0 - Capital\ Expenditures - Property,\ Plant,\ and\ Equipment\ Purchased\ via\ a\ M\&A}{CFFO} \quad (8)$$

Yilmaz (2024b) provides an application of the secondly evolved Yilmaz ratio.

The Apple's Secondly Evolved Yilmaz Ratio (2024b) could be calculated numerator detailed using cash flow statement (Apple 2019) like that:

Yilmaz (2024b:) calculates Yilmaz ratio like that:

The Apple's Secondly Evolved Yilmaz Ratio (2019):

= (69,391- 10495- 624):69,391

= 58,272:69,391

=0.8398

= %83.98

The ratio changed from 19.91% to 83.98%. It is an increase about 321.80%. The ratio is about 4 folds of the former (Yilmaz,2022) ratio. Its reason is the change of the two items of the nominator. In Yilmaz (2024b), the first item of the numerator is CFFO instead of "cash flow" and the adding of the new item "Property, Plant, and Equipment Purchased via a M&A". While the first item of the numerator was 24,311 in Yilmaz (2022), it was 69,391 in Yilmaz (2024b). Amount of the numerator increased and the amount of ratio increased, mathematically, because of not increasing the denominator (CFFO) of the ratio.

The Reason of Change of the Numerator

There are three items in the numerator of Yilmaz Ratio. These are shown as below:

- CFFO
- Capital Expenditures
- Property, Plant, and Equipment Purchased via a M&A

The Reason of Change of the First Item the Numerator

Yilmaz invested the first item of his ratio's numerator. The subject is connected with the subject of free cash flow calculation methods. Actually, there are twenty-two free cash flow calculation methods except Yilmaz's free cash calculation method which is the numerator of the valid Yilmaz ratio given Yilmaz (2024b). The methods were produced by Ferris et.al. (1992), Moyer at.al. (1995), Ross at. al. (2003), Keown et.al. (2005), Verminnen et.al. (2005), Richardson (2006), Vishwanath (2007), Brigham and Houston (2009), Brealey et.al. (2011), Cornett et.al. (2012), Bekaert and Hodrick (2012), Damadoran (2012), Palpeu and Healy (2013), Ivanovska et.al. (2014), Kieso at. al. (2016), Ketz (2016), Lewellen and Levellen (2016), Stice et. al. (2017), Bhandari and Adams (2017), Rupic at. al. (2017), Khatik and Patil (2018), and Adame et.al. (2023).

The methods being calculating by using income statement were Ross at. al. (2003), Keown et.al (2005), Verminnen et.al. (2005), Vishwanath (2007), Brigham and Houston (2009), Brealey et.al (2011), Damadoran (2012), Bekaert and Hodrick (2012), Cornett et.al. (2012), Palpeu and Healy (2013), Ivanovska et.al (2014), and Khatik and Patil (2018). They start their free cash flow calculations with profit. Yilmaz did not consider these methods to use his ratio's (Yilmaz Ratio's) numerator.

Then, he investigated the FCF calculation methods using cash flow statement. They were Ferris et.al (1992), Moyer at. All (1995), Richardson (2006), Kieso at al. (2016), Ketz (2016), Stice et al. (20 17), Lewellen and Lewellen (2016), Bhandari and Adams (2017), Rupic at all (2017), and Adame et.al. (2023).

The all FCF calculation methods using cash flow statement methods except Lewellen and Lewellen (2016:1144), 90% of all methods using cash flow statement, start with CFFO to their calculations even though they use different concepts instead of CFFO. Ferris et.al (1992:182) and Ketz (2016:48-49) use really CFFO in their FCF calculation methods. Different Concepts Used instead of CFFO is shown at the Table 1 as below.

Table 1: FCF Methods Using Another Term Instead of CFFO as Their First Items

Writer/s and year	The first item
Moyer (1995:805)	CF
Richardson (2006:167) Bhandari and Adams (2017:12) Rupic et al (2017:77)	CFO
Kieso et al. (2016:222-223)	Net cash provided by operating activities
Stice et.al. (2017:51) Adame et.al (2023:3)	Operating cash flow

Source: This table was produced by this writer.

Yilmaz eliminated the FCF calculation method of Lewellen and Lewellen (2006) because the writers use "cash flow" instead of CFFO or it's a similar given at the Table 1. "Cash flow" is exactly different than "CFFO" or its similar because its meaning is the net of all cash flows from operating, investing, and financing activities. The CFFO is net cash flow of only operating activities.

After he investigated the FCF calculation methods above, he decided to use an item given in cash flow statement. At the same time, he preferred the CFFO because he used the term CFFO in his two corporate finance models, too[9] and he thinks that the CFFO is a very important item and concept for his cash flow based financial management studies and analyzes.

[9] My two corporate finance models are Yilmaz Corporate Cash Management (CCM) model (look at. Yilmaz, 2011), and Yilmaz Cash Flow Based Corporate (CFCF) Model (look at Yilmaz 2022, 2023a,2023b,2024a, 2024b, and 2024c).

The Most Stable Item of Yilmaz Ratio

The second item "Capital Expenditures" of the numerator of Yilmaz Ratio did not change at all. It is the most stable item of the ratio. This shows a stable relationship between CFFO and capital expenditures.

This is a "produce cash ↦invest the cash" relationship. In my opinion, there is very important sign for financial investors in this relationship. This will be considered in future studies of Yilmaz Ratio.

The Reason of the Adding a Third Item to the Numerator

The reason of adding a new item "Property, Plant and Equipment Purchased via a M&A" to Yilmaz Ratio's numerator could be explained via Finance literature like that:

Van Horne (1971:9 and 175) says that he considers mergers and acquisitions from the standpoint of an investment decision. These external investment opportunities can be evaluated in the same general manner as an investment proposal that is generated internally. A prospective acquisition is much the same as any investment proposal: there is an initial outlay of cash or stock, followed by expected future benefits. The major *D*difference is that with acquisitions, the initial cost may not be established, it is frequently subject to bargaining.

Ross et.al (2003:841) think that the acquisition of one firm by another is an investment made under uncertainty and the basic principles of valuation are applied. One firm should acquire another only if doing so generates a positive net present value for the shareholders of the acquiring firm. However, the NPV of an acquisition candidate can be difficult to determine.

McLaney (2009:388) thinks that a business will become a bidder when it sees an opportunity to make an investment with a positive incremental net present value. It is likely to perceive such an opportunity either:

1. where it considers that the incremental cash flows from the investment, when discounted at a rate consistent with the level of risk associated with those cash flows, are positive; and/or
2. where the reduction in the level of risk associated with the bidder's existing cash0 flows causes the appropriate rate for discounting those cash flows to fall, thus increasing the NPV of the existing cash flows of the bidder.

During free cash flow calculation discussion, Ketz (2016:49) says that to obtain more informative measure when calculating capital expenditures, users should include what is spent to acquire land, building, and other capital assets- even if obtained via a business combination.

As it could be seen at the paragraphs above, capital assets produced by a business itself and acquired by M&A are both have the same NPV procedure and included in "cash flow from investing activities" section of the cash flow statement. For this reason, the third item is used to calculate the numerator (FCF) of my free cash flow ratio.

The two evolutions in Yilmaz Ratio could be summarized at the Table 2 below.

Table 2: Evolution of the Items of Yilmaz Ratio

The Item	Yilmaz (2021) Arising	Yilmaz (2022) The First Evolution	Yilmaz (2024b) The Second Evolution
The First Item of Numerator	Cash flow	Cash flow	CFFO
The Second Item of Numerator	Capital Expenditures	Capital Expenditures	Capital Expenditures
The Third Item of Numerator	There was no this item	There was no this item	Asset purchasing via M&M
The only item of the Denominator	Cash flow	CFFO	CFFO

Source: This table was produced by this writer.

An Important Warning About the Use of Numerator

During the calculation of Yilmaz Ratio, the numerator should be like that:

CFFO-Capital Expenditures-Property, Plant, and Equipment Purchased via a M&A *(11)*

This is the free cash flow calculation method produced by Yilmaz (2024b). because of more efficient free cash flow consideration.

The calculation methods created before (Yilmaz, 2024b) Ross at. al. (2003), Keown et.al (2005), Verminnen et.al. (2005), Vishwanath (2007), Brigham and Houston (2009), Brealey et.al (2011), Damadoran (2012), Bekaert and Hodrick (2012), Cornett et.al. (2012), Palpeu and Healy (2013), Ivanovska et.al (2014), and Khatik and Patil (2018) start their free cash flow calculations with profit. Yilmaz did not consider these methods to use his ratio's (Yilmaz Ratio's) numerator because of his preference of cash flow statement.

Yilmaz did not prefer the FCF calculation method of Lewellen and Lewellen (2016) because of their use of "cash flow" in their method. Yilmaz' s current preference about cash concept is CFFO, not cash flow.

Ferris et.al (1992), Moyer at. All (1995), Richardson (2006), Kieso at al. (2016), Ketz (2016), Stice et al. (20 17), Lewellen and Lewellen (2016), Bhandari and Adams (2017), Rupic at all (2017), and Adame et.al. (2023) used cash flow statement to produce the FCF. However, their FCF does not cover the item "Property, Plant, and Equipment Purchased via a M&A" except Ketz (2016). However, Ketz (2016) has a fourth item "Investment in Intangible assets". Yilmaz (2021) does not adopt the fourth item of Ketz (2016) in his numerator Yilmaz(2024b).

After this explanations, Yilmaz Ratio should be calculated like that:

$$\textit{Yilmaz Ratio} = \frac{\textit{CFF0- Capital Expenditures- Property, Plant, and Equipment Purchased via a M\&A}}{\textit{CFFO}} \qquad (9)$$

Yilmaz Ratio should not be precepted as "FCF/CFFO" because of the availability of 22 other FCF calculation methods other than that of Yilmaz (2024b).

The standardization issue of the FCF calculation methods will be discussed in another article by this writer in the near future, probably this year.

The evolution of Yilmaz ratio is shown numerator detailed at the Table 3 like that:

Table 3: Yilmaz Ratio Calculation Methods by Stages

Year	Stages of Yilmaz Ratio	Numerator Detailed Yilmaz Ratio
2021	Stage I	$\frac{\text{Cash Flow - Capital Expenditures}}{\text{Cash Flow}}$
2022	Stage II	$\frac{\text{Cash Flow- Capital Expenditures}}{\text{CFFO}}$
2024	Stage III	$\frac{\text{CFF0- Capital Expenditures- Property, Plant, and Equipment Purchased via a M\&A}}{\text{CFFO}}$

Source: This table was produced by this writer.

Usage of Yilmaz Ratio in Corporate Finance

Free Cash Flow Based Corporate Finance

Yilmaz Ratio started to be used in Yilmaz (2021). The article is about the use of free cash flow in corporate finance. When financial analysis function is being studied during the article is being prepared, the writer (Yilmaz) thought that the free cash flow concept could be a ratio like other ratios in financial analysis. In so doing, the Yilmaz ratio raised. It is in the service of the theory of corporate finance since that day.

Cash flow Based Corporate Finance (CFCF) Model

The ratio started to be used during the CFCF model Yilmaz (2022) is being created. The model covers 30 ratios in its first stage. After citating the 29 ratios from the other writers, the writer thought that the Yilmaz ratio created by Yilmaz (2021) could be used in the CFCF model. As a result, the ratio was added to the 29 ratios and they were 30 ratios anymore.

The ratio was used efficiently during the building of the dividend policy function of CFCF model in Yilmaz (2024b).

Yilmaz (2024b:12) shows that dividend policy of CFCF model covers total 9 cash flow ratios. The six of them are Group A ratios and three of them are Group B ratios. The Yilmaz ratio is the sixth of the Group A ratios. Its code is ACFRDP6. It means the sixth Group A ratio of dividend policy function of CFCF model. The name of the ratio was "free cash flow" and its calculation method

was “free cash flow: CFFO”. However, in the page 14 of the same article, Yilmaz (2024b) invented a different FCF calculation method. It was like that:

Free Cash Flow = CFF0- Capital Expenditures - Property, Plant, and Equipment Purchased via a M&A

This calculation method of Yilmaz is the numerator of the Stage III Yilmaz Ratio in this (Yilmaz,2025) article. Yilmaz says about his this new FCF calculation method in Yilmaz (2024b:14) like that:

“It is not the same as the calculation of Yilmaz (2021) because this writer changed his opinion about his free cash flow calculation method given in Yilmaz (2021). Its reason is not this article’s subject. It will be explained in another article by this writer in the near future.”

The numerator of Yilmaz Ratio in Yilmaz (2021) was like that:

Free Cash Flow = Cash Flow - Capital Expenditures

The Yilmaz ratio shows free cash produced by a business’s operations after its cash capital investment and capital investment through its M&As.The owners see the free cash flow after the two kinds of capital investment. They see that their company is investing and still has the cash it produced itself to be paid them (the owners).The Yilmaz (2021) FCF ratio and the numerator of this ratio does not show this information.

Other Potential Usage Fields of Yilmaz Ratio in the Future

Yilmaz’s free cash flow based corporate finance insight (Yilmaz, 2021) has eight functions. They are financial analysis, working capital management, capital budgeting, merger&acqusition, capital structure, dividend policy, leverage, and valuation.

The use of Yilmaz ratio in financial analysis function of free cash flow based corporate finance was explained in this article.

There could be some fields to be used in some other functions of free cash flow based corporate finance. These are working capital management, M&A decisions, dividend policy and valuation.

Cash management is a sub-function together with the account payable management, inventory management, and temporary investment management. Yilmaz ratio measures how much a company spends from its homemade cash (CFFO) for capital investment and its sister concept the M&A investment. This could be thought a cash management function in working capital management.

A finance manager could use free cash status to decide about its potential M&As. Yilmaz ratio could be thought more healthy than free cash flow because of its more detailed numerator and exactly cash flow-based denominator. For instance, 0.90 Yilmaz ratio means that the target company produces free cash flow by 90% of its CFFO. In addition to free cash flow, the target company invest by 10%, 1-0.90=0.10, of CFFO. The acquires company could compare the Yilmaz ratio with the other alternative target companies’ Yilmaz ratios.

Dividend policy could also become a working field through Yilmaz ratio. In this context, excess free cash could be distributed to the stockholders. For this purpose, after a determined Yilmaz ratio, such as 0.70, a dividend payment or stock buyback could be fulfilled as a dividend policy.

For company valuation decision, of course, net present values of expected free cash flow could be used. After all, a finance manager could have an opinion via Yilmaz ratio about the investment

and the creation of free cash flow a company hiring him and other companies he is interested in valuation for M&A, for credit sales, and for stable inventory purchasing decisions.

Yilmaz's cash flow based corporate finance (CFCF) model (Yilmaz, 2023a) has six functions. They are working capital management, capital budgeting, merger&acquisition, capital structure, dividend policy, and corporate valuation.

The use of Yilmaz ratio in dividend policy function of cash flow based corporate finance (CFCF) model was explained in this article.

In addition to the dividend policy function of Yilmaz's CFCF model, working capital management, the M&A, and corporate valuation functions of the model could be used Yilmaz ratio as a tool to manage the "cash flow based corporate finance". The logic to use Yilmaz ratio in these three functions is that the free cash flow is also a part of general cash flow.[10]

Yilmaz ratio is very different from traditional payout ratio because Yilmaz ratio uses data from only cash flow statement. Traditional payout ratio uses data from income statement and cash flow statement. The denominator of dividend payout ratio is net income and it is not cash based, it is accrual based. Yilmaz ratio is exactly cash based. All of its items in the numerator and denominator are from cash flow statement. The reason of being better measure of Yilmaz ratio is all positive and negative items are from cash flow statement and its use of cash concept is cash which is produced by a business itself. Yilmaz ratio does not cover any cash from its financing activities and investing activities. All of them are from operating activities. The items of Yilmaz ratio are already collected and paid.

An Application on the Apple Corporation's Cash Flow Statements to Prove Yilmaz Ratio's Evolution Need

Calculation of the Three Stages of Yilmaz Ratio

Calculation to show the evolution of Yilmaz Ratio using the Form 10-K cash flow statement is shown at the Table 4 like that:

[10] Yilmaz (2011) divides cash into two groups. They are dependent cash and free cash. In this context, free cash flow is a part of cash. Look at to this article (Yilmaz ,2011) for more detailed information about this subject.

Table 4: Calculation of Yilmaz Ratio of the Apple Corp by Stage

Title and the Ratio	The Calculation of the Ratio
Yilmaz Ratio (2021) Stage I= (Increase/(Decrease) in Cash, Cash Equivalents, and Restricted Cash- Capital Expenditures _____ (Increase/(Decrease) in Cash, Cash Equivalents, and Restricted Cash	2019[11]: = (24,311-10,495) /24,311 = 13,816 /24,311 = +0.5683 2020: = (-10,435- 7,309)/ -10,435 =-17,744[12]/-10,435 =+1.7004 2021: = (-3,860-11,085)/-3,860 = -14,945/-3,860 =+3.8718 2022: = (-10,952-10,708)/- 10,952= -21,660/-10,952 =+1.9777 2023: = (5,760-10,959)/5,760 =-5,199/5,760 = - 0.9026 2024: = (-794-9,477)/-794) =-10,241/-794 =+12.8980

[11] This calculation is the same as the calculation fulfilled by Yilmaz (2021:88).

[12] This calculation is the same as the calculation fulfilled by Yilmaz (2021:87).

Yilmaz Ratio (2022) Stage II= (Increase/(Decrease) in Cash, Cash Equivalents, and Restricted Cash-Capital Expenditures _____ CFFO	2019[13]: = (24,311-10,495)/ 69,391 =13,816/69,391 =0.1991 2020[14]: = (-10,435-7,309)/80,674 = -17,744/80,674 =-0.2199 2021: = (-3,860- 11,085)/ 104,038 = -14,945/104,038 =-0,1436 2022: = (-10,952-10,708)/122,151 = -21,660/122,151 = -0.1773 2023: = (5,760-10,959)/110,543 =-5,199/110,543 = -0.0470 2024: = (-794-9,477)/118,254 =-10,241/118,254 = -0.0866

[13] This calculation is the same as the calculation fulfilled by Yilmaz (2022:12).

[14] This calculation is the same as the calculation fulfilled by Yilmaz (2022:12)

Yilmaz Ratio (2024) Stage III= CFF0- Capital Expenditures- Property, Plant, and Equipment Purchased via a M&A _____ CFFO	2019: = (69,391-10,495-624)/ 69,391 =58,272/69,391 =0.8398 2020: = (80,674-7,309-1,524)/ 80,674 = 71,841/80,674 =0.8905 2021[15]: = (104,038-11,085-33)/ 104,038 = 92,920/104,038 =0.8931 2022[16]: = (122,151-10,708-306)/ 122,151 = 111,137/122,151 = 0.9098 2023[17]: = (110,543-10,959-0)/ 110,543

[15] This calculation is the same as the calculation fulfilled by Yilmaz (2024b:16).

[16] This calculation is the same as the calculation fulfilled by Yilmaz (2024b:16).

[17] This calculation is the same as the calculation fulfilled by Yilmaz (2024b:16).

	=99,584/110,543 = 0.9009 2024: =118,254-9,477-0)/ 118,254 =108,807/118,254 =0.9201

Source: This table was produced by this writer.

Proving of the Evolution of Yilmaz Ratio on the Apple Corp. Cash Flow Statement

The effect of the evolutions of Yilmaz Ratio is shown on Yilmaz Ratios of the Apple Corp. calculated by using its cash flow statements at the table 5 below.

Table 5: Change of Yilmaz Ratio of the Apple Corp by Stages in the Years 2019-2024

The Years	**Stage I Yilmaz (2021)**	**Stage II Yilmaz (2022)**	**Stage III Yilmaz (2024b)**
2019	0.5683	0.1991	0.8398
2020	1.7009	- 0.2199	0.8905
2021	3.8718	-0.1436	0.8931
2022	1.9777	-0.1773	0.9098
2023	-0.9026	-0.0470	0.9009
2024	12.8980	-0.0866	0.9201
Average	3.3524	-0.1392	0.8924

Source: This table was produced by this writer.

Ranges of the Yilmaz Ratios of the three stages have been calculated at the Table 6 like that: are

Table 6: Ranges of the Yilmaz Ratios by Stages in 2019- 2024

Stage	Highest value	Lowest value	Range[18]
Stage 1	12.8980	-0.9026	13.8006
Stage 2	0.1991	-0.2199	0.4190
Stage 3	0.9201	0.8398	0.0803

Source: This table was produced by this writer.

The Yilmaz (2024b) ratios change between 0.8398 and 0. 9201.The average is 0.8924.

The ranges are 13.8006, 0.4190, and 0.0803 by the Stages, respectively. It shows that the more stable range for Yilmaz ratios for the Apple Corp. are the Stage III, that is Yilmaz (2024b), ratios. The range is only 0.0803. The Stage I 's range is 13.8006. This means that the difference between lowest and highest values of the ratios of the eight years (2019-2024) is 13.8006 folds, close to14 folds. It is very illogical because the change is about 14 folds between the highest and lowest values and the number of the years is only six. It seems very unbalanced. I think its most important reason is negative items of the Stage I Yilmaz ratios. The years 2020, 2021, 2022, and 2024 the Stage I Yilmaz ratios of the Company have net negative items in their numerators and denominators. This mathematically requires "- (x) - = +" or "negative multiply negative is equal positive" sign, so the ratios of these years are "positive" signed. For this reason, the Stage I Yilmaz ratios seem as if they are very regular, positive signed. This is only because of the mathematics rule -x- = +. The "cash flow" numbers are generally negative signed because it is a net of the three kinds of cash flows, the operating, investing, and financing. The writer already has changed this Stage I to the Stage II in Yilmaz (2022) and the Stage III in Yilmaz (2024b).

The Stage II Yilmaz ratios have negative signs except the Year 2019 ratio. Its reason is the inconsistency between "cash flow" and "CFFO". The Yilmaz Stage II uses "cash flow" in its numerator and "CFFO"in its denominator. Cash flow calculates the net of cash flows from operating, investing, and financing. The all years give negative net cash flow except the 2019.However, the all denominators of the Stage II Yilmaz ratio give positive outputs. As a mathematics rule, "-: += - "or in verbally "negative divided by positive is equal negative". The only positive output is 2019 because the only positive output of the numerators is 2019.

Being about all of the Stage II Yilmaz ratios and its average (-0.1392) negative shows being of the Stage II Yilmaz ratio meaningless. The purpose is not to have negative outpost from the Yilmaz ratios. For this reason, the Stage III Yilmaz ratio was produced. The net "cash flow" in the numerator was changed with the CFFO in the Stage III Yilmaz ratio by Yilmaz (2024b).

It seems that the Stage III Yilmaz ratio is very meaningful and consistent with each other. The is average 0.8924 and the range 0.0803, that is, 0.9201- 0.8398=0.0803. It seems pretty balanced so it is the final Yilmaz Ratio. After this time, all analyzes and comments will be fulfilled using the Stage III Yilmaz Ratio.

[18] The ranges were calculated through the formula "Highest Value – Lowest value".

In this study, the Yilmaz Ratio analysis of the Application Company was not fulfilled because this study's aim was to show the differences of the three stages and prove the necessity of the evolution in Yilmaz ratio.

Conclusion

Yilmaz (2021) built Yilmaz Ratio because of the opinion of best use of free cash flow in financial analysis of free cash flow based corporate finance.

Yilmaz (2022) brought about two innovations to Yilmaz Ratio. These are:

1. It brings about the CFFO to the ratio,
2. It brings about a definition to the ratio.

This definition is valid today, too. This means that the definition was produced in Yilmaz (2022) and is still adopted today, too.

Yilmaz (2024b) adds and brings two new items to the numerator of Yilmaz Ratio. They are:

1. CFFO
2. Property, Plant, and Equipment Purchased via a M&A.

CFFO came to the ratio because of its inconsistency with the item "Cash Flow" of the numerator of the ratio. In so doing, the two items became used same concept CFFO.

Property, Plant, and Equipment Purchased via a M&A was added to the numerator because it was considered that the investment via M&A is another kind of capital investment so it should be added to the capital investment pool.

The updated and valid Yilmaz Ratio is the ratio given in Yilmaz (2024b). It is calculated like that:

$$\text{Yilmaz Ratio} = \frac{\text{CFF0- Capital Expenditures- Property, Plant, and Equipment Purchased via a M\&A}}{\text{CFFO}} \quad (10)$$

Yilmaz ratio was used in two new finance subjects to date. They are:

1. Free cash flow based corporate finance (Yilmaz, 2021).
2. Cash flow based corporate finance (CFCF) model (Yilmaz,2022, 2023a, 2024b).
3. Its usage fields could be broadened in financial theory in the future.
4. Implication of this study to the theory of finance will be very important. The reasons for that:
5. This ratio decreases capital investment through M&A in addition to the capital investment which a business produces and constructs itself from CFFO to calculate free cash flow for its numerator.
6. The ratio's denominator is CFFO, not all cash flow. Yilmaz uses only the cash flow the company produces and creates itself. This is an assurance for owners and other investors such as debt holders.

7. Estimation of stock price through Yilmaz ratio will be possible. For this, there is a need for regression analysis. My expectation is there should be a negative correlation (-Corr) between Yilmaz ratio and stock price. Its reason is the decrease of capital investment from investment and investment through M&A from CFFO decreases the FCF and for this reason, Yilmaz ratio decreases. If investment increases, the ratio decreases. It should be tested via regression analysis in capital markets.
8. Yilmaz ratio has a potential to be used in investment banking, investment management, stock brokerage, and personel finance. More usage field may arise or could be thought in near future.

REFERENCES

Adame, K.W., J.L. Koski, K.W. Lem, and S.E. McVay (2023), "Free Cash Flow Disclosure in Earnings Announcements", Journal of Financial Reporting, Vol. 8, No. 2. pp. 1–23.

Bekaert G. and R. Hodrick (2012), International Financial Management, Pearson Education, Second Edition, New Jersey.

Bhandari S.B. and M. T. Adams (2017), "On the Definition, Measurement, and Use of the Free Cash Flow Concept in Financial Reporting and Analysis: A Review and Recommendations", Journal of Accounting and Finance, 17,1119.

Brealey, R.A., S. C. Myers, and F. Allen (2011), Principles of Corporate Finance, Mc Graw Hill-Irwin, Tenth Edition, New York.

Brigham E.F. and J.F. Houston (2009), Fundamentals of Financial Management, South-Western Cengage Learning, 12th Edition, Ohio

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

Damadoran A., Investment Valuation, John Wiley&Sons, (2012), Third Edition, www.damodaran.com.

Ferris K. R., K. L. Tennant, and S.I. Jerris (1992), How to Understand Financial Statements, Prentice Hall, New Jersey.

Ivanovska N., Z. Ivanovski, and Z. Narasanov (2014), "Fundamental Analysis and Discounted Free Cash Flow Valuation of Stocks at Macedonian Stock Exchange", UTMS Journal of Economics 5 (1), pp.11–24.

Jensen, Michael. C. (1986), Agency Cost of Free Cash Flow, Corporate Finance, and Takeovers, American Economic Review, 76, 323-329.

Khatik S.K. and M. Patil (2018), Company Valuation using free cash flow technique: A case study of National Thermal Power Corporation Limited", Journal of Advance Management Research, Vol. 6 Issue.3, pp. 110-122.

Keown, Arthur j., John. D. Martin, J. William Petty, and David F. Scott Jr., (2005), Financial Management Principles and Applications, Pierson Prentice Hall, New Jersey.

Ketz, J. Edward (2016), "Free Cash Flow and Business Combinations", The CPA Journal, November, pp.48-53.

Kieso D. E, J.J. Weygandt, and T.D. Warfield (2016), Intermediate Accounting, John Wiley&Sons, New Jersey,

Lewellen, J. and K. Lewellen, 2016, Investment and Cash Flow: New Evidence, Journal of Financial and Quantitative Analysis, 51,1135-1164.

McLaney, E. (2009), Business Finance Theory and Practice, Prentice Hall, Eight Edition, England.

Moyer R.C., J.R. McGuigan and W.J. Kretlow (1995), Contemporary Financial Management, West Publishing Company, Sixth Edition, Minneapolis.

Palpeu K.G. and P. M. Healy (2013), Business Analysis and Valuation Using Financial Statements, South Western Cengage Learning, Ohio

Richardson S. (2006), "Overinvestment of Free Cash Flow", Review of Accounting Studies 11 (23), pp.159-189.

Ross S.A, R.W. Westerfield and B.D. Jordan (2003), Fundamentals of Corporate Finance, Sixth Edition, McGrawHill, Boston,

Rupic, I.B., D.B. Obradovic, and B. Rupic (2017), Free Cash Flow Valuation Model in Capital Budgeting, European Project Management Journal, 7, 75-84.

Stice D., E. K. Stice, and J.D. Stice (2017), Cash Flow Problems Can Kill +Profitable Companies, International Journal of Business Administration, 8, 46-54.

Tuovila, Alica (Reviewed by Janet Berry-Johnson) (2020)' "What Is Restricted Cash on a Balance Sheet? With Examples", https://www.investopedia.com/terms/r/ restricted -cash.asp (November 19,2020)

US Security and Exchange Commission, Form 10-K, September 28, 2019, Apple Inc., Commission File Number:001-36743.

Verminnen P., P. Quiry, M. Dallocchio, Y. Le Fur, and A. Salvi (2005), Corporate Finance, John Wiley&Sons Ltd., West Sussex, England.

Vishwanath S.R.(2007), Corporate Finance: Theory and Practice, Response Books, Second Edition, New Delhi, India.

Yilmaz H. (2011), Another Perspective to Corporate Cash Management: A New Model and Definition. International Journal of Humanities and Social Science, 1(11Special Issue), 284-289.

Yilmaz H. (2021), "Free Cash Flow Based Corporate Finance", British Journal of Economics, Finance and Management Sciences, Vol.18. No. 1, pp.82-91.

Yilmaz H (2022), "Cash Flow Based Corporate Finance (CFCF) Model", American Journal of Financial Management, Vol.5, No.9, pp. 1-18

Yilmaz H. (2023a), "Some Improvements in Cash Flow Based Corporate Finance (CFCF) Model", American Journal of Financial Management, Vol.6, No.10, pp. 1-24.

Yilmaz H. (2023b), "Working Capital Management Function of Cash Flow Based Corporate Finance (CFCF) Model", American Journal of Finance, Vol.8, Issue.1, pp.31-49.

Yilmaz H.(2024a), "Capital Structure Function of Cash Flow Based Corporate Finance (CFCF) Model", American Journal of Finance, Vol.9, Issue.1, pp.1-14.

Yilmaz H. (2024b), "Dividend Policy Function of Cash Flow Based Corporate Finance (CFCF) Model", Journal of Banking and Finance Management, Volume 5, Issue 1, pp. 11-19.

Yilmaz H. (2024c), "Capital Budgeting, M&A, and Valuation Functions of Cash Flow Based Corporate Finance (CFCF) Model.", Journal of Banking and Finance Management, Volume 5*, 1, 29-36.