GuruFocus User Manual: DCF Calculator

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1. DCF Calculator Overview and Access

Unlike basic valuation ratios like the price-earnings ratio and the price-to-sales ratio, the discounted cash flow valuation model combines the company's balance sheet value, future business earnings and earnings growth. As we will explore in this user manual, this valuation model can determine the company's intrinsic value based on several factors.

GuruFocus developed the DCF calculator so that you can estimate a company's fair value by simply entering five inputs: the earnings per share, the future business growth rate, the terminal growth rate, the years of terminal growth and the discount rate. We will further discuss these inputs in detail, and then explore how to interpret the output.

Accessing the DCF calculator

You can access the DCF calculator in two ways:

- On the Search bar underneath the blue ribbon, enter a ticker symbol, and then select DCF Calculator from the drop-down menu.
- From the gray ribbon underneath the "+ Add to Portfolio" button, click on DCF.

Figures 1.1 and 1.2 show how to access the DCF calculator, and Figure 2 displays the initial DCF Calculator screen. We will use **Amazon.com Inc.** (AMZN) as an example.
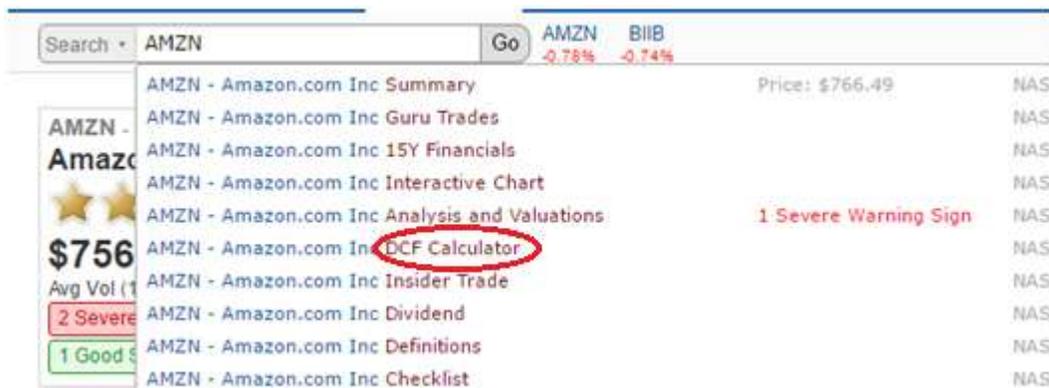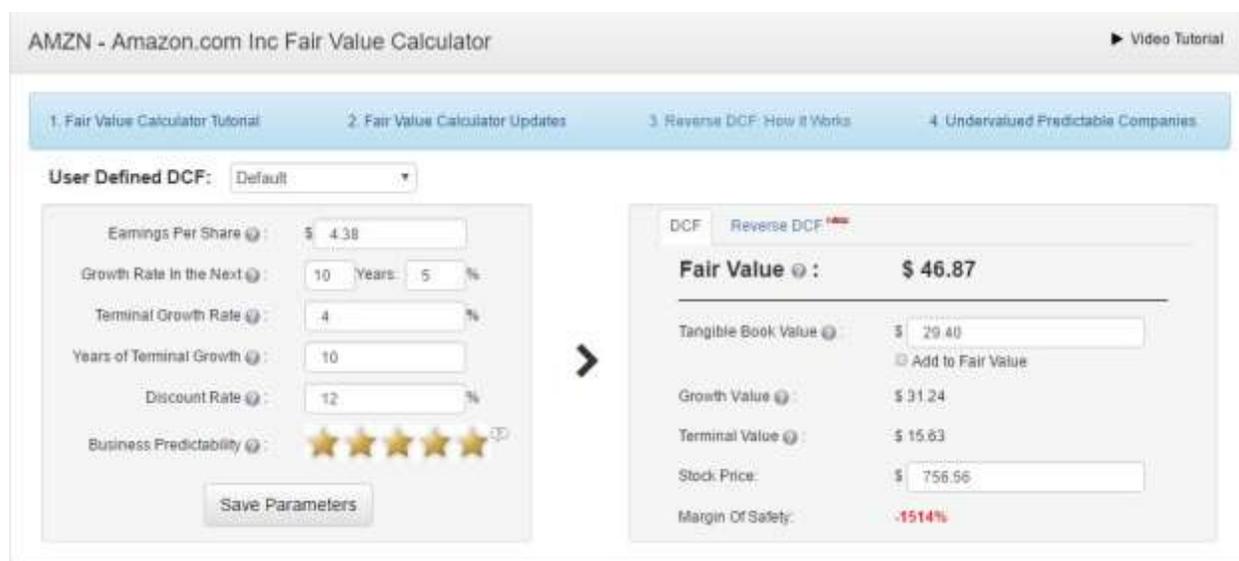

Figure 1.1

Figure 1.2

Figure 2

2. Using the DCF Fair Value Calculator

As illustrated in Figure 2, the DCF Calculator conveniently lists the inputs on the left and the outputs on the right. Each white box allows you to update one component of the DCF model.

DCF Calculator Inputs

As discussed earlier, the DCF Calculator computes the company's fair value based on five inputs, the first five items on the left side of Figure 2. Each cell contains the following default values:

- For earnings per share, we use the company's trailing 12-month earnings per share without nonrecurring items (ttm_eps_nri).
- By default, the future business growth rate is the 10-year earnings growth rate. If this growth rate is less than 5%, we use 5% instead. We also cap the growth rate to 20%.
- We set the terminal growth rate to 4%, close to the long-term annual rate of inflation.
- The terminal stage, by default, lasts 10 years. We then assume no additional contributions beyond the terminal stage.
- We set the discount rate to 12%, close to the long-term average annual stock market return.

The DCF Calculator also allows you to input customized parameters. For example, you could compute the fair value as you know from business finance classes by entering the free cash flow per share instead of earnings per share. Additionally, you can use your own terminal growth rate, discount rate and number of years of terminal growth.

Note the Save Parameters button underneath the company's predictability rank. Click this button to open a pop-up window similar to the one shown in Figure 3.

DCF Parameters

Name:

Earnings Per Share : $4.38

Growth Rate In the Next: 10 Years: 5%

Terminal Growth Rate : 4%

Years of Terminal Growth : $10

Discount Rate : $12

Tangible Book Value : $29.40

[Save] [Edit]

Figure 3

The Save Parameters feature allows you to save your customized inputs for later use. You can enter your own values for the terminal growth rate, years of terminal growth and the discount rate, and save these parameters. For example, you can set up a DCF calculator so that it mimics the DCF model used in finance class:

- Earnings per share = Amazon's trailing 12 month FCF per share. ($ 17.87)
- Growth rate in the next 10 years = Amazon's 10-year FCF growth rate. (15.9%)
- Years of terminal growth = 99
- Discount rate = Amazon's weighted average cost of capital. (13.66%)

Figure 4.1 displays the Save Parameters pop-up window with the updated inputs and Figure 4.2 displays the DCF Fair Value Calculator using these parameters.

Figure 4.1

Figure 4.2

Even though you cannot delete the Default set of parameters, you can delete customized sets by selecting the desired set of parameters and then clicking the delete button. You should see a dialog box similar to the one in Figure 4.3. Click on the "Delete" button to remove the selected set of parameters from the drop-down menu.

Figure 4.3

DCF Calculator Outputs

As you update the inputs, the DCF Calculator automatically updates the fair value to reflect the new parameters. This section will discuss how to interpret the values on the right.

The fair value is probably the most important value on the right as it illustrates the purpose of the DCF calculator. This value captures the expected stock price based on the inputs you entered on the left. You can compare this value to the company's current stock price to determine the margin of safety. Companies with higher margins of safety usually offer higher value potential than those with low margins of safety.

You can add the company's tangible book value to the fair value by clicking the "Add to Fair Value" checkbox. A check mark indicates that the fair value includes the tangible book value. By default, we do not add tangible book value to the company's fair value.

As a reference, the DCF Calculator includes the growth value and the terminal value as part of the outputs. The former is the present value (PV) of the cumulative earnings during the growth stage while the latter is the PV of the cumulative earnings during the terminal stage.

By default, the DCF Calculator computes the margin of safety using the company's current share price. To determine a company's margin of safety at a certain share price, you can set the stock price to the desired value.

The Reverse DCF Feature

GuruFocus's DCF Calculator also contains the "Reverse DCF" feature, which reverse-engineers the growth rate based on the company's current stock price and the five inputs discussed earlier. You can access this feature by clicking the "Reverse DCF" tab above the company's fair value. Once you click the tab, you should see a screen similar to the one in Figure 5.
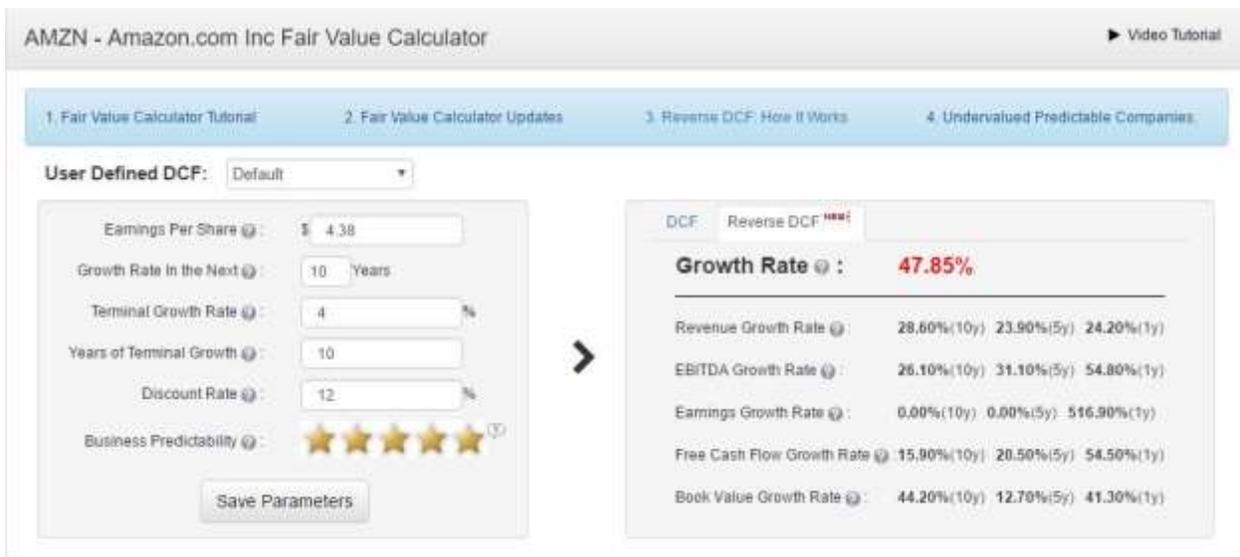
Figure 5

As illustrated in Figure 5, you will see the expected earnings per share growth in lieu of fair value. This growth rate represents the future business growth rate that justifies the current stock price. The DCF Calculator lists the company's growth rate data below the reverse-DCF growth rate, allowing you to determine the feasibility of the reverse-DCF growth rate.

3. **DCF Calculator, Frequency Asked Questions (FAQs)**

- Do we have to use the company's earnings per share?
    - o No. You can either use the earnings per share or the free cash flow per share in the DCF calculation. We use TTM EPS by default as earnings give a stronger correlation between intrinsic value and margin of safety than free cash flow does.
    - o However, if you choose to use free cash flow per share in your DCF calculation, you must also use the FCF growth rate to maintain consistency.
- Where are you getting the earnings per share and growth rates?
    - o Below the calculator, you will see a list of financial data for the company. Please see Figure 6 as a reference. This section of the DCF page contains the following financial data:
        - ▪ 1-year, 5-year and 10-year growth rates for revenue, EBITDA, EBIT, EPS without NRI, FCF and book value
        - ▪ The year-end values for the above financial data for the past three full years, the trailing 12 months and the past full quarter

Financial Data of Amazon.com Inc

Annual Rates (per share)	10 yrs	5 yrs	12 months
Revenue Growth (%)	28.60	23.90	24.20
EBITDA Growth (%)	26.10	31.10	54.80
EBIT Growth (%)	3.20	-7.10	130.10
EPS without NRI Growth (%)	0.00	0.00	516.90
Free Cash Flow Growth (%)	15.90	20.50	54.50
Book Value Growth (%)	44.20	12.70	41.30

Per Share Data	Annuals (Year End)			TTM	Quarterly
Fiscal Period	Dec13	Dec14	Dec15	Sep16	Sep16
Revenue ($)	160	193	224	266	67.45
EBITDA	8.39	10.49	17.42	24.31	5.55
EBIT	1.60	0.39	4.68	8.40	1.19
Free Cashflow	4.37	4.22	15.37	17.87	5.45
EPS ($)	0.59	-0.52	1.25	4.38	0.52
EPS (w/o Non-Recur. Items) ($)	0.59	-0.52	1.25	4.38	0.52
Book Value	21.23	23.10	28.42	37.44	37.44

Click to See These in Charts:

Revenue | EPS | EBITDA | EBIT | Free Cash Flow | Book Value | Shares Buyback Ratio (%)

Annual Chart

YTD   1Y   3Y   5Y   10Y   All   Save   Embed

-- AMZN: Revenue per Share
— Growth Trendline (5-year:21.05%)

414.9

224.3

0

-200

2000   2005   2010   2015

Figure 6

Note: clicking one of the blue links underneath "Click to See These in Charts" displays the per-share trendline for the financial parameter clicked.

FAQ section, continued:

- Why do you include the company's predictability rank in the DCF Calculator?
    - o The DCF model assumes that the projected earnings consistently grow at the 10-year rate listed. If a company's predictability rank is less than two stars, the computed fair value may contain significant volatility.

- o In fact, the DCF Calculator warns you if the fair value may be inaccurate due to low predictability. You will see the following underneath the company's fair value:
  - Result may be inaccurate due to low predictability of business
- What is the maximum number of terminal years? I thought it was infinity.
  - o As of the writing of this manual, we only support up to 99 years of terminal growth. To simulate infinite terminal growth, please enter 99 for number of terminal years.
- Do I need a premium membership to access the DCF Calculator?
  - o You don't need a premium membership to access the DCF Calculator. However, only premium and Premium Plus members can save parameters and view historical trend charts.
- I like your use of green and red for margin of safety on the DCF view and the growth rate on the Reverse DCF view. What is the meaning behind these colors?
  - o For the DCF page, the margin of safety is green if positive and red if negative.
  - o We highlight the reverse-DCF growth rate in green if the growth rate is below the company's 10-year earnings growth rate and red if the growth rate exceeds the 10-year earnings growth rate. Green indicates a good sign while red indicates a warning signal.