

# FINANCIAL MANAGEMENT

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## Free Cash Flows and Fundamental Valuation



# Learning Goals

Structure of Cash Flow Statement

--*Operating & Investing & Financing Activities*—

Definition of *Free Cash Flows*

*Discounted Cash Flow Valuation* (DCF Model)

Fundamental Free Cash Flow Valuation Technique

# FREE CASH FLOW

Cash available for distribution to investors after firm pays for new investments or additions to working capital.

Free Cash Flow = EBIT – taxes + depreciation  
- change in net working capital  
- capital expenditures

# Free Cash Flow Valuation Model (FCF Model)

A free cash flow valuation model determines the value of an entire company as the present value of its expected free cash flows discounted at the firm's weighted average cost of capital, which is its expected average future cost of funds over the long run.

where

$$V_C = \frac{FCF_1}{(1 + r_a)^1} + \frac{FCF_2}{(1 + r_a)^2} + \dots + \frac{FCF_\infty}{(1 + r_a)^\infty}$$

- $V_C$  = value of the entire company
- $FCF_t$  = free cash flow *expected* at the end of year  $t$  end of year  $t$
- $r_a$  = the firm's weighted average cost of capital

# The Statement of Cash Flows

The statement of cash flows provides a summary of the firm's

- operating,
  - investment, and
  - financing cash flows and reconciles them with changes in its cash and marketable securities during the period.
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- This statement not only provides insight into a company's investment, financing and operating activities, but also ties together the income statement and previous and current balance sheets.

# The Statement of Cash Flows - Structure

**Structure:**

**Cash flow from operations**

**+**

**Cash flow from investments**

**+**

**Cash flow from financing**

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**Change in cash balance**

# Types of Activities

## Operating activities

- Delivering or producing goods for sale
- Providing services
- Cash effects of transactions and other events that enter into the determination of income

## Investing activities

- Acquiring and selling (or otherwise disposing of) securities that are not cash equivalents or productive assets that are expected to benefit the firm for long periods
- Lending money and collecting on loans

# Types of Activities

## Financing activities

- Borrowing from creditors and repaying principal
- Obtaining resources from owners and providing them with a return on the investment



# Preparing the Statement of Cash Flows

- Calculate the changes in all of the balance sheet accounts, including cash.
- List the changes in all of the accounts except cash as inflows or outflows.
- Categorize the flows by operating, financing, or investing activities.
- The inflows less the outflows balance to and explain the change in cash.

**FIGURE 4.1** How Cash Flows During an Accounting Period

**Operating Activities**

*Inflows*

Cash from sales of goods or services  
Returns on equity securities  
(dividends)  
Returns on interest-earning assets  
(interest)

*Outflows*

Payments for purchase of inventory  
Payments for operating expenses  
(salaries, rent, etc.)  
Payments for purchases from suppliers  
other than inventory  
Payments to lenders (interest)  
Payments for taxes

**Investing Activities**

*Inflows*

Cash from sales of property, plant,  
and equipment  
Cash collections from loans (principal)  
to others  
Cash from sales of debt or equity securities  
of other entities (except securities traded  
as cash equivalents)\*  
Cash from sale of a business segment

*Outflows*

Purchases of property, plant, and equipment  
Loans (principal) to others  
Purchases of debt or equity securities of  
other entities\*

**Financing Activities**

*Inflows*

Proceeds from borrowing  
Proceeds from issuing the firm's own  
equity securities

*Outflows*

Repayments of debt principal  
Repurchase of a firm's own shares  
Payment of dividends

**Total Inflows less Total Outflows = Change in cash for the accounting period**

\*Cash flows from purchases, sales, and maturities of trading securities shall be classified based on the nature and purpose for which the securities were acquired.

<b>Inflow</b>	<b>Outflow</b>
– Asset account	+ Asset account
+ Liability account	– Liability account
+ Equity account	– Equity account

# BALANCE SHEET

BALANCE SHEET OF HOME DEPOT (Figures in \$ millions)					
Assets	2009	2008	Liabilities and Shareholders' Equity	2009	2008
Current assets			Current liabilities		
Cash and marketable securities	1,421	519	Debt due for repayment	1,020	1,767
Receivables	964	972	Accounts payable	8,185	8,221
Inventories	10,188	10,673	Other current liabilities	<u>1,158</u>	<u>1,165</u>
Other current assets	<u>1,327</u>	<u>1,198</u>	Total current liabilities	10,363	11,153
Total current assets	13,900	13,362			
Fixed Assets			Long-term debt	8,662	9,667
Tangible fixed assets			Deferred income taxes	319	369
Property, plant, and equipment	37,345	36,223	Other long-term liabilities	2,140	2,198
Less accumulated depreciation	<u>11,795</u>	<u>9,989</u>			
Net tangible fixed assets	25,550	26,234	Total liabilities	21,484	23,387
Intangible asset (goodwill)	1,171	1,134	Shareholders' equity:		
Long-term investments	33	36	Common stock and other paid-in capital	6,390	6,133
Other assets	223	398	Retained earnings	13,588	12,452
			Treasury stock	<u>\$ (585)</u>	<u>(808)</u>
Total Assets	40,877	41,164	Total shareholders' equity	19,393	17,777
			Total liabilities and shareholders' equity	40,877	41,164

**Current Assets – Current Liabilities = *Net Working Capital***

# INCOME STATEMENT, 2009

	\$ million
Net Sales	66,176
Cost of goods sold	43,764
Selling, general & administrative expenses	15,907
Depreciation	1,806
<b>Earnings before interest and income taxes (EBIT)</b>	<b>4,699</b>
Interest expense	676
<b>Taxable income</b>	<b>4,023</b>
Taxes	1,362
<b>Net income</b>	<b>2,661</b>
Allocation of net income	
Dividends	1,525
Addition to retained earnings	1,136

# Statement of Cash Flows of Home Depot, 2009

	Mill \$
<b>Cash provided by operations</b>	
Net income	<b>2,661</b>
Noncash expenses	
Depreciation and amortization	1,806
<b>Changes in working capital</b>	
Decrease(increase) in accounts receivable	8
Decrease(increase) in inventories	485
Increase(decrease) in accounts payable	(36)
Decrease(increase) in other current assets	(129)
Increase(decrease) in other current liabilities	(7)
Total decrease(increase) in working capital	321
<b><i>Cash provided by operations</i></b>	<b><i>4,788</i></b>
<b>Cash flows from investments</b>	
Cash provided by(used for) disposal of (additions to) PPE	(1,122)
Sales(acquisitions) of other investments	141
<b><i>Cash provided by(used for) investments</i></b>	<b><i>(981)</i></b>

# Statement of Cash Flows of Home Depot, 2009

	Mill \$
<b>Cash provided by (used for) financing activities</b>	
Additions to (reduction in) short-term debt	(747)
Additions to (reduction in) long-term debt	(1,005)
Dividend paid	(1,525)
Net issues (repurchases) of stock	480
Other	(108)
<b><i>Cash provided by(used for) financing activities</i></b>	<b><i>(2,905)</i></b>
<b>Net increase(decrease) in cash and cash equivalents</b>	<b>902</b>

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# FREE CASH FLOW; Home Depot

$$\begin{aligned}\text{Free Cash Flow} &= 4,699 - 1,362 + 1,806 \\ &\quad - (-321) \\ &\quad - 981 \\ &= \$ 4,483 \text{ million}\end{aligned}$$

Some of this money was paid out to Home Depot's investors as interest or dividends.

The remainder was used to buy back stock or repay debt.

# Free Cash Flow Valuation Model (FCF Model)

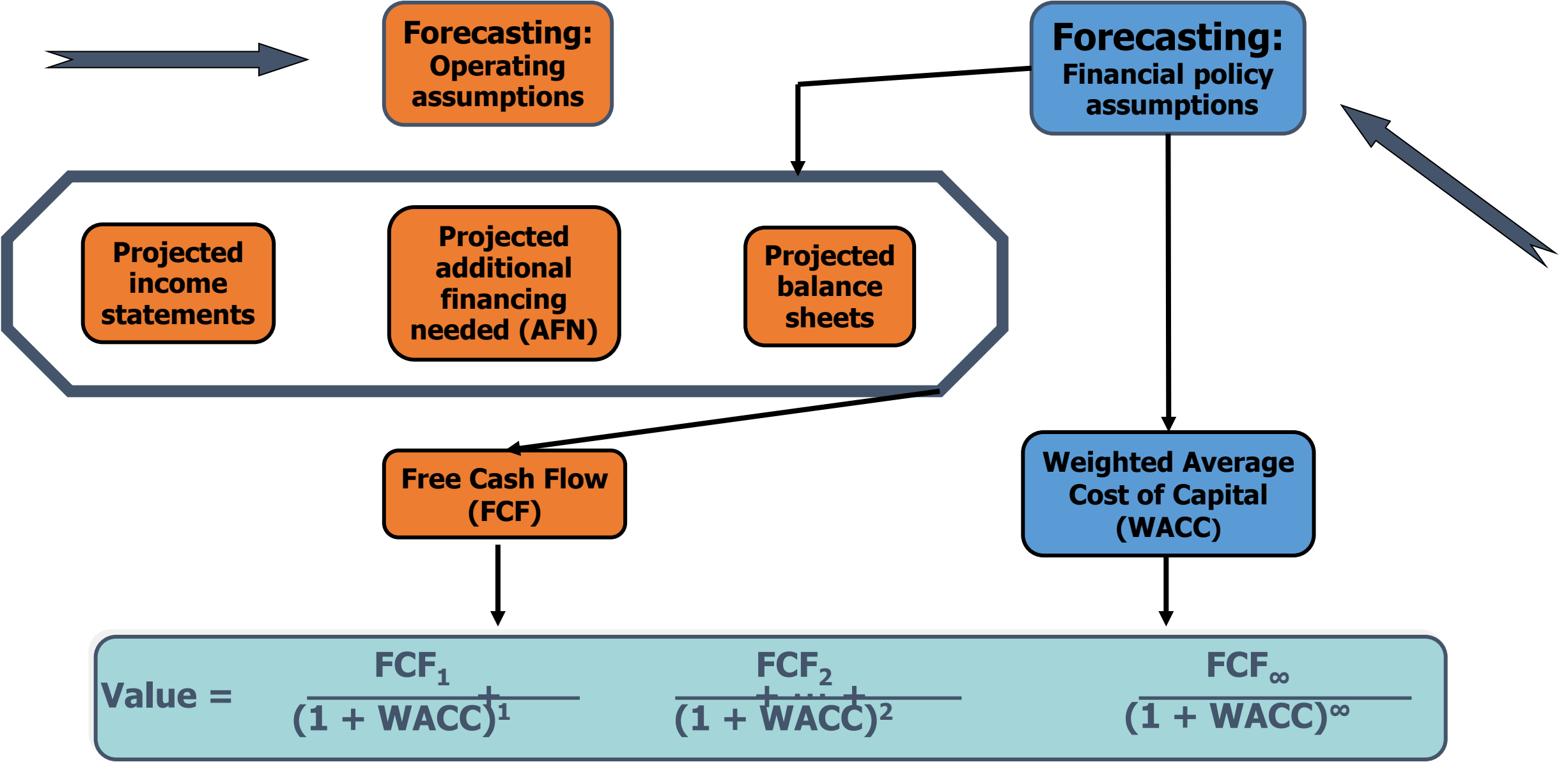
A free cash flow valuation model determines the value of an entire company as the present value of its expected free cash flows discounted at the firm's weighted average cost of capital, which is its expected average future cost of funds over the long run.

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- $V_C$  = value of the entire company
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# Free Cash Flow Valuation Model & Discounting Cash Flow



# FREE CASH FLOW

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- $V_C$  = value of the entire company
- $FCF_t$  = free cash flow *expected* at the end of year  $t$
- $r_a$  = the firm's weighted average cost of capital

# Finding Firm Value

The value of the entire company;  $V_C$ , is the market value of the entire enterprise (that is, of all assets),  
to find common stock value,  $V_S$ ,

- subtract the market value of all of the firm's debt,  $V_D$ , and
- the market value of preferred stock,  $V_P$ , from  $V_C$ .

$$V_S = V_C - V_D - V_P$$

Brown, Inc. wishes to determine the value of its stock by using the free cash flow valuation model. The firm's CFO developed the following data:

### Brown, Inc.'s Data for the FCF Valuation Model

Free cash flow		Other data
Year ( $t$ )	( $FCF_t$ )	
2016	\$400,000	Growth rate of FCF, beyond 2020 to infinity, $g_{FCF} = 3\%$
2017	450,000	Weighted average cost of capital, $r_a = 9\%$
2018	520,000	Market value of all debt, $V_D = \$3,100,000$
2019	560,000	Market value of preferred stock, $V_P = \$800,000$
2020	600,000	Number of shares of common stock outstanding = 300,000

# Constant Growth Model Formula

The constant-growth model is a widely cited dividend valuation approach that assumes that dividends will grow at a constant rate, but a rate that is less than the required return.

$$P_0 = \frac{D_0 \times (1 + g)^1}{(1 + r_s)^1} + \frac{D_0 \times (1 + g)^2}{(1 + r_s)^2} + \dots + \frac{D_0 \times (1 + g)^\infty}{(1 + r_s)^\infty}$$

The Gordon model is a common name for the constant-growth model that is widely cited in dividend valuation.

$$P_0 = \frac{D_1}{r_s - g}$$



# Calculation of the Value of the Entire Company for Brown, Inc.

**Step 1.** Calculate the present value of the free cash flow occurring from the end of 2021 to infinity, measured at the beginning of 2021.

$$\begin{aligned}\text{Value of } FCF_{2021 \rightarrow \infty} &= \frac{FCF_{2021}}{r_a - g_{FCF}} \\ &= \frac{\$600,000 \times (1 + 0.03)}{0.09 - 0.03} \\ &= \frac{\$618,000}{0.06} = \$10,300,000\end{aligned}$$

# Calculation of the Value of the Entire Company for Brown, Inc.

**Step 2.** Add the present value of the FCF from 2021 to infinity, which is measured at the end of 2020, to the 2020 FCF value to get the total FCF in 2020.

$$\text{Total FCF}_{2020} = \$600,000 + \$10,300,000 = \$10,900,000$$

**Step 3.** Find the sum of the present values of the FCFs for 2016 through 2020 to determine the value of the entire company, VC.

## Calculation of the Value of the Entire Company for Brown, Inc.

Year ( $t$ )	$FCF_t$ (1)	$(1 + r_a)^t$ (2)	Present value of $FCF_t$ [(1) $\times$ (2)] (3)
2016	\$ 400,000	1.090	\$ 366,972
2017	450,000	1.188	378,788
2018	520,000	1.295	401,544
2019	560,000	1.412	396,601
2020	10,900,000 <sup>a</sup>	1.539	<u>7,082,521</u>
Value of entire company, $V_C =$			<u><u>\$8,626,426</u></u> <sup>b</sup>

<sup>a</sup>This amount is the sum of the  $FCF_{2020}$  of \$600,000 from Table 7.4 and the \$10,300,000 value of the  $FCF_{2021 \rightarrow \infty}$  calculated in Step 1.

<sup>b</sup>This value of the entire company is based on the rounded values that appear in the table. The precise value found without rounding is \$8,628,234.

## Calculation of the Value of the Entire Company for Brown, Inc.

Years	FCF	Discount Factor(%)	Present Value
2016	400.000	0,9174	366,960
2017	450.000	0,8417	378,765
2018	520.000	0,7722	401,544
2019	560.000	0,7082	396,592
2020	10.900.000 (600.000 +10.300.000)	0,6497	7,081.73

FCF total PV. = 8.626.426 \$

Firm Value = 8.626.426 - 3.100.000 - 800.000  
= 4.726.426 \$

Price per share  
= 4.726.426 / 300.000  
= 15,76 \$

# Discount factors

t	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	12%	14%
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9346	0.9259	0.9174	0.9091	0.8929	0.8772
2	0.9803	0.9612	0.9426	0.9246	0.9070	0.8900	0.8734	0.8573	0.8417	0.8264	0.7972	0.7695
3	0.9706	0.9423	0.9151	0.8890	0.8638	0.8396	0.8163	0.7938	0.7722	0.7513	0.7118	0.6750
4	0.9610	0.9238	0.8885	0.8548	0.8227	0.7921	0.7629	0.7350	0.7084	0.6830	0.6355	0.5921
5	0.9515	0.9057	0.8626	0.8219	0.7835	0.7473	0.7130	0.6806	0.6499	0.6209	0.5674	0.5194
6	0.9420	0.8880	0.8375	0.7903	0.7462	0.7050	0.6663	0.6302	0.5963	0.5645	0.5066	0.4556
7	0.9327	0.8706	0.8131	0.7599	0.7107	0.6651	0.6227	0.5835	0.5470	0.5132	0.4523	0.3996
8	0.9235	0.8535	0.7894	0.7307	0.6768	0.6274	0.5820	0.5403	0.5019	0.4665	0.4039	0.3506
9	0.9143	0.8368	0.7664	0.7026	0.6446	0.5919	0.5439	0.5002	0.4604	0.4241	0.3606	0.3075
10	0.9053	0.8203	0.7441	0.6756	0.6139	0.5584	0.5083	0.4632	0.4224	0.3855	0.3220	0.2697
11	0.8963	0.8043	0.7224	0.6496	0.5847	0.5268	0.4751	0.4289	0.3875	0.3505	0.2875	0.2366
12	0.8874	0.7885	0.7014	0.6246	0.5568	0.4970	0.4440	0.3971	0.3555	0.3186	0.2567	0.2076

# Free Cash Flow Valuation Model (FCF Model)

**Step 4.** Calculate the value of the common stock.

$$VS = \$8,626,426 - \$3,100,000 - \$800,000 = \$4,726,426$$

The value of Brown's common stock is therefore estimated to be \$4,726,426.

By dividing this total by the 300,000 shares of common stock that the firm has outstanding, we get a common stock value of

= **\$15.76** per share

$$(\$4,726,426 \div 300,000).$$