CHAPTER FOUR

Cash Accounting, Accrual Accounting, and Discounted Cash Flow Valuation

Concept Questions

C4.1. There are difficulties in comparing multiples of earnings and book values - the "old techniques" — across borders because accounting methods differ. But to revert to cash flows also has its dangers. It ignores depreciation and amortization, true economic costs. It ignores value generated and lost in the absence of cash flows - revenue from receivables, pension expenses not paid for, deferred taxes, contingent liabilities, etc.

It might be better to reconstruct "good" consistent accrual accounting than to throw out the baby with the bath water. If cash is king, his subjects are not well served. Look at the cash flows for Wal-Mart Stores in Exhibit 4.2.

C4.2. Not necessarily. A firm can generate higher free cash flow by liquidating its investments. A highly profitable (and highly valuable) firm can have low (or even negative) free cash flows because it is investing heavily to capitalize on its investment opportunities. Again, see the Wal-Mart example in Exhibit 4.2.

C4.3. Not necessarily. Cash flow from operations increased considerably in 1997 over 1996 but the 1997 free cash flow was generated partially by a reduction in investment. Will this drop in investment harm future profits and cash flows?

C4.4. The answer is (b). Matching cash received from sales with cash spent on inventory does not match value received with value given up to earn the cash, because

it recognizes the cost of unsold good against the receipts from goods sold. Accrual accounting accomplishes the matching because only the cost of goods sold is recognized against the revenue from goods sold.

C4.5. The difference is explained by net (after-tax) interest payments and the total accruals in earnings – the amount of earnings that does not involve cash flows:

Earnings = Cash from operations – net interest payments + accruals

See equation 4.5 and Box 4.5.

(The GAAP definition of cash from operations includes net interest payments, inappropriately)

C4.6. Free cash flow is earnings (before after-tax interest) minus operating accruals minus cash investment in operations:

C – I (free cash flow) = Earnings + net interest payments – accruals – cash investment

Or (as in equation 4.6 and Box 4.5),

Earnings = C – I - net interest payments + accruals + cash investment

C4.7. Because it is an investment to store cash that temporarily is not needed in operations. The investment in operations only comes when the T-bill is sold and the cash from the sale is invested in operating assets.

C4.8. Levered cash flow is after net interest payments; as it involves interest from financing activities, it is called a levered measure. Unlevered cash flow is cash from

operations without the any consideration of interest from financing activities. See equation 4.3.

C4.9. Interest draws taxes; interest income incurs tax and interest expense yields a tax deduction. So, to understand the effect of interest on earnings or cash flows, interest must be after tax.

Exercises

E4.1 Approximate Discounted Cash Flow Valuation for Dell Computer Corporation

Discounted cash flow values are calculated by taking the present value of expected free cash flows and subtracting the value of the net debt. For Dell, the net debt is negative. That is, the firm has more interest-bearing assets than liabilities:

Net debt, 1999 = \$512 - \$2,661 = -\$2,149

(a) The valuation with a perpetuity forecast for the continuing value and a discount factor of $(1.12)^t$ for each future period, t is:

$$\text{Value of firm} = \frac{3{,}444}{1.12} + \frac{3{,}547}{1.254} + \frac{3{,}310}{1.405} + \left[\frac{3{,}310}{0.12}\right] \Big/ 1.405$$

$$= 3{,}075 + 2{,}829 + 2{,}356 + 19{,}632$$

$$= 27{,}892$$

Value of equity = Value of firm - value of net debt

= 27,892 – (- 2,149)

= 30,041 million

Thus, Dell's equity value is comprised of \$27,892 million in the value of the firm's operations plus \$2,149 million in debt assets. On 2,543 million shares, the calculated per-share value is \$11.81.

(b) The valuation with growth of 3% per year is:

$$\text{Value of firm} = \frac{3{,}444}{1.12} + \frac{3{,}547}{1.254} + \frac{3{,}310}{1.405} + \left[\frac{3{,}310 \times 1.03}{1.12 - 1.03}\right] \Big/ 1.405$$

$$= 3{,}075 + 2{,}829 + 2{,}356 + 26{,}962$$

$$= 35{,}222 \text{ million}$$

Value of equity = Value of firm - value of net debt

= 35,222 +2,149

= 37,371 million

Or, 2,545 million shares, the value per share is \$14.70. The \$14.70 is well below the market price of \$40.00. You conclude that the market is forecasting a growth rate of free cash flow over 3%. Indeed, one can solve for the growth rate that yields a market value for the equity of 101,720 million (\$40 x 2,543 shares).

$$101{,}720 = 3{,}075 + 2{,}829 + 2{,}356 + \left[\frac{3{,}310 \times g}{1.12 - g}\right] \Big/ 1.405 + 2{,}149$$

So g = 1.0918

That is, given the market agrees with the forecasts of free cash flow for 2000, 2001, and 2002, it is forecasting that free cash flows will grow at a rate of 9.18% after 2002.

E4.2. Debt Financing and Dividend Discount Techniques

The exercise shows how dividends can be affected by borrowing, with no effect on value.

(a) As this is a pure-equity firm (no debt), dividends equal free cash flow: C – I ≡ d, and DCF analysis and dividend discounting analysis are the same thing. Dividend forecasts are:

Year Ahead (t)	1	2	3	4	5
Dividends	53	5	49	41	75

PV of Dividends over 5 years = \$173.44

Discounting at $(1.08)^{-t}$

(b) This issue of debt without any change in investments will simply increase dividends in the year of issue by \$28M and decrease them in subsequent years by the cash coupon (\$2.8M), because there is no effect of free cash flow: C – I ≡ d + F, and as the left-hand side of this equation is unchanged, – ΔF = Δd. This firm is going to borrow to pay dividends.

The projected dividends are:

Year Ahead (t)	1	2	3	4	5

Dividends	53	33	46.2	38.2
72.2				

The dividends and their present value have clearly increased. But has the value of the equity? Of course, NO. A firm can't generate value by issuing debt (with investment constant), or by proposing to issue debt, because debt is always zero net present value. This highlights the problem with dividend discounting: firms can "manufacture" dividends by borrowing.

(c) Adjust the forecasted dividends in year 5 because dividends are reduced to make the bond repayment (and coupon payment): 75 – 2.8 – 28 = 44.2. Now take present value of the dividend stream: the amount is $172.20. This differs from the $174.44 in part (a), and looks as if the debt has changed the value.

However, this calculation discounts the cash flows from the debt with an 8% discount rate rather than the 10% rate for the debt. Discount the free cash flows (before debt flows) at 8% yields the $174.44 calculated in part (a). Then take off the present value of the debt flows discounted at 10%. You will find that the latter is zero, so the value of the equity is the same as in (a) without the debt. This demonstrates that a debt issue is zero net present value when the forecast horizon includes <u>all</u> cash flows with respect to the debt. This is the M & M financing irrelevance result. It also demonstrates the fallacy of forecasting dividends with debt outstanding at the end of the forecast period.

(In exercises such as these, dividends can be discounted at an equity cost of capital that adjusts for added risk to the equity from borrowing. Whereas in part (a) the equity cost of capital is 8%, it's higher with borrowing. See Chapter 13.)

E4.3. Debt Financing and DCF Techniques

This exercise shows how dividends, financing and investment affect free cash flow and DCF valuation.

(a) As pointed out in the solution to E4.2, DCF analysis and dividend discounting are the same thing for a pure-equity firm (with no debt):

PV of free cash flows= PV of divs = $173.44

(b) If the original dividend (in part (a) of E4.2) is to be maintained, the new financing must go into new investment in year 2, because C – I always equals d + F. The coupon payment in years 2 - 5 will be made from increased cash flows from operations or reductions in investment. The free cash flows are:

Year Ahead (t)	1	2	3	4	5
d	53	5	49	41	75
+ F	0	(28)	2.8	2.8	2.8
= C–I	53	(23)	51.8	43.8	
	77.8				

The PV of free cash flows at $(1.08)^{-t}$ is $155.62 M.

This is less than the answer in part (a): free cash flows are reduced in year 2 and the horizon is not long enough to recoup the cash flows from operations that flow from the investment. Projected investment reduces DCF value for a given forecast horizon.

Does this projected financing with new investment change the value of the equity? The financing is at zero net present value so will have no effect on time 0 value. The investment will have no effect if it is zero net present value. If it is positive net present value, one would be willing to pay more for the equity. However, the valuation technique will only pick this up if the horizon

is long enough to capture the subsequent cash inflows that are the cash return to the investment. Note that capitalizing the free cash flow in year 5 to get a terminal value will work only if the free cash flow continues as a perpetuity. This will be so only if there are constant financing flows in subsequent years (as C – I ≡ d + F) and thus the debt repayment is rolled over (other things constant).

(c) Make the change to year-5 free cash flow. The debt repayment will have to come from reduced investment if the dividend is to be maintained and that will affect subsequent free cash flow. The present value of free cash flow will be reduced even if the investments to be liquidated are zero NPV investments.

E4.4. Levered and Unlevered Cash Flow: Intel

Cash flow calculations (tax rate = 37%)

	1992	1993	1994	1995	1996	1997	1998
Levered CFO	1,635	2,801	2,981	4,026	8,743	10,008	9,191
Net interest:							
Interest expense	54	50	57	29	25	27	34
Interest income	133	188	273	415	406	799	792
	(79)	(138)	(216)	(386)	(381)	(772)	(758)
Tax on interest (37%)	29	51	80	143	141	286	280
	(50)	(87)	(136)	(243)	(240)	(486)	(478)
Unlevered CFO	1,585	2,714	2,845	3,783	8,503	9,522	8,713
Reported investments	1,480	3,337	2,903	2,687	5,268	6,859	6,506
Net investment in debt securities	252	1,404	462	(863)	2,244	2,358	2,043
Cash investment	1,228	1,933	2,441	3,550	3,024	4,501	4,463
Free cash flow	357	781	404	233	5,479	5,021	4,250

Note how the GAAP financial statement confuses the free cash flow calculation: when a firm generates a lot of cash from operations and invests it in interest-bearing securities, reported free cash flow is reduced.

E4.5. Reconciling Earnings to Cash Flow from Operation: PepsiCo

This exercise tests accounting relation 5.1:

Accruals = Earnings – Levered cash flow from operations

= $1,076 - $992

= $84 million

E4.6. Reconciling Earnings to Free Cash Flow: Coca-Cola

This exercise tests accounting relation 5.2:

Earnings = Levered free cash flow + investment + accruals

= $285 + $1,466 - $62

= $1,689 million

(Note: accruals are negative as net income is less than cash from operations.)

E4.7. Accounting Relations

(a) Cash = Revenues – Change in net receivables

= $405 – 32

= $373 million

(b) Change in payable = wages expense – cash wages

= $335 - $290

= $45 million

(c) PPE (end) = PPE (beginning) + Investment – Depreciation

∴ New Investment = Changes in PPE + Depreciation

= $50 + 131

= $181 million

E4.8. An Examination of Revenues: Microsoft

Cash revenue = Revenue reported – Change in Accounts Receivable + Change in Unearned Revenue

= $19.747 – 0.785 + 1.351

= $20.313 billion

(The effect of the unearned revenues is $1.351 billion.)

Microsoft might like to report low revenues so not to attract the attention of regulators. Indeed, the firm was facing a big antitrust suit in 1999.

E4.9. Dividend Discounting and Simple Valuations: New York State Electric and Gas

This exercise illustrates the problems one runs into in using discounted dividend approaches to calculation. And it illustrates the use of simple calculations, which will be employed in later chapters when we have a firmer grasp on what is to be forecasted to value firms.

(a) Set out the discounting analyses as follows:

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Dps		2.00	2.02	2.06	2.10	2.14	2.18	2.00	1.40	1.40
Discount factor (1.12)		1.12	1.254	1.405	1.574	1.762	1.974	2.211	2.476	2.773
PV of dps		1.79	1.61	1.47	1.33	1.21	1.10	0.90	0.57	0.50
Total PV	10.48									
Continuing value[1]										11.67
PV of CV	4.21									
Value of equity (per share)	14.69									

[1]Continuing value = $\frac{1.40}{0.12}$ = 11.67; it is assumed (without any further information) that the dps of $1.40 in 1995 and 1996 will be paid inperpetuity.

(b) Substitute the present value of the 1996 price for the assumed continuing value:

PV of dps to 1996	$10.48
PV of 1996 price of $21 5/8	$7.80
	$18.28

So, if an investor had purchased the stock of $20 7/8 in 1987, she would (ex post) have lost value: price, cum-dividend, did not appreciate at 12% p.a.

The 9% discount rate was used to discount the cash flow from operations on the basis of the risk of the cash flows. But returns to equity in dividends are riskier, because of the financing risk of debt, so dividends should be discounted at a higher rate. These issues will be addressed later in the book.

(c) This requires a simple valuation of a perpetuity:

$$V_{1987}^{E} = \frac{2.64}{0.12} = \$22$$

This value is indeed close to the 1987 market price of $20 7/8 in 1987.

But will the $2.64 dps be maintained? Will it grow? Isn't the payout arbitrary? Well, for utilities it was not arbitrary, at one time. It was tied closely to earnings.

(d) The simple valuation in 1999 is:

$$V_{1999}^{E} = \frac{0.84}{0.12} = \$7.00$$

This is far from the price of $29. Has the relationship between dividends and earnings changed? Or is the market price overvalued?

An implied growth rate is calculated by solving for g in the following valuation:

$$Price_{1999} = \frac{dps_{1999} \times g}{1.12 - g}$$

So,

$$29 = \frac{0.84 \times g}{1.12 - g}$$

$\therefore$ g =1.0885 (or a 8.85% growth rate)

The implied growth rate is considerably higher than that in 1987 (when it was close to 0%). This is to be expected: with payout lower, more value is retained in the business to generate higher dividends in the future.

But, is an 8.85% growth rate justified? One would have to forecast earnings to see if, at the current payout, the growth can be generated. Analysts were forecasting eps of $1.81 for 1999 (a growth of 19.9% over the $1.51 for 1998) and $2.00 for 2000 (a growth of 10.5% over the forecasted 1999 earnings). Can this growth be maintained? Note that the stock traded at P/E of 16 on forecasted 1999 earnings.

(e) Dividends can be arbitrary; payout ratios are not necessarily connected to value, at least not in the short run. A firm with very good prospects might drop its dividend to finance valuable expansion. And a firm with poor prospects can increase its dividend because it has no good projects to invest in.

Minicases

M4.1. Comparison of Free Cash Flows and Profitability: Analog Devices, Inc.

This case compares profitability and cash flow and introduces the student to themes in the next chapter. Make sure students understand the concept of free cash flow and emphasize that free cash flow is not indicative of profitability. Use the case to introduce concepts involved in accrual accounting and how accrual earnings differ from free cash flow. So introduce the material at the end of Chapter 4. Start the discussion with the Home Depot example on the Chapter 4 web page or the Wal-Mart example in Chapter 4 of the text.

A. Free cash flow calculation (Tax rate = 36%)

	1992	1993	1994	1995	1996	1997	1998
Levered CFO	33	89	183	210	144	286	225
Net interest:							
Interest expense	6	7	7	4	11	13	11
Interest income	0	1	5	8	17	16	17
	6	6	2	(4)	(6)	(3)	(6)
Taxes on interest	2	2	1	2	2	1	2

(36%)	4	4	1	(2)	(4)	(2)	(4)
Unlevered CFO	37	93	184	208	140	284	221
Reported investment	66	67	163	239	306	226	187
Net investment in securities	0	0	73	9	62	12	47
Cash investment in operations	66	67	90	230	244	214	140
Free cash flow	(29)	26	94	(22)	(104)	70	81

Note: ideally cash interest should be used, but this is not available in the question.

B. Free cash flow is not necessarily linked to profitability for two reasons:

1. Profitability is based on earnings and earnings include non-cash sources of value added in operations. So (for example) goods sold on credit (for a receivable) are included in revenue even though they do not generate a cash flow. And depreciation involves a real economic loss, a cost that has to be covered by revenues.

2. Free cash flow is reduced by cash investments that generate higher profits in the future.

Recognizing point 2, free cash flow and future profitability are often negatively related: investing to increase future profitability reduces free cash flow. And it can be that free cash flow and current profitability are negatively related, as here: when a firm has a particularly profitable year, it invests more. But this is not necessarily the case; look at Intel in the earlier exercise, E4.4.

The typical correlation between free cash flow and ROCE is only about 0.10.

C. Market value of the equity = 164 million shares × \$29 = \$4,756 million

$$\text{Price/Levered CFO} = \frac{4{,}756}{225} = 21.1$$

Unlevered price/Unlevered CFO $= \frac{4{,}756 + 0}{221} = 21.5$

(The "little net debt" is ignored)

Unlevered price/Free cash flow $= \frac{4{,}756 + 0}{81} = 58.7$

The price-to-free cash flow ratio is meaningless, as always: one might pay more for negative free cash flow than positive free cash flow. The price-to-CFO ratios indicate the pricing of cash flow from operations. But why not use P/E? Well, if one were suspicious of the depreciation and amortization figure, one might use P/CFO. But you'd be missing part of the value generation (in value lost in economic depreciation). A firm can yield a higher P/CFO by substituting plant for labor, but that may be inefficient (and lose value).

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M4.2 Discounted Cash Flow Valuation: Coca Cola Company and Home Depot, Inc.

Introduction

This case applies the DCF valuation to two firms, one where it works (somewhat) and the other where is does not work well at all. Use the case to

- Demonstrate the mechanics of DCF valuation. Students are usually familiar with the basic net present value techniques from other courses and can be relied upon to do the calculations.
- Illustrate the difficulties in applying DCF analysis, particularly to Home Depot.
- Demonstrate some of the adjustments that have to be made to the GAAP numbers to calculate unlevered free cash flow from operations. (Chapter 10 expands on further adjustments.)
- Compare free cash flow and earnings as measures of value added from operations. Stress that free cash flow is partially a liquidation concept. See the material at the end of the chapter.
- Set up the conceptual basis for moving to accrual accounting models. Home Depot is valued in case M14.1 in Chapter 14 using accrual methods. The case here can be used as an introduction to the later case.

- If this is the first valuation exercise of the course, discuss the issues involved in calculating the cost of capital. Display some skepticism about guessing market risk premiums. See appendix to Chapter 3.

The Mechanics of DCF Valuation

The DCF model values the operations (the firm) by discounting expected free cash flows and subtracting the value of the net debt. The mechanics are as follows:

1. Forecast free cash flow for each period ahead, t.
2. Discount each forecast with that period's discount rate, ρ^t. The cost of capital for both firms here is 1.09, so each period's rate is 1.09^t.
3. Calculate a continuing value at the forecast horizon, and discount it to present value.
4. Sum the discounted cash flows.
5. Subtract the value of the net debt, equal to debt obligations minus investments in securities that absorb excess cash (debt investments here).

The chapter outlines how one might go about the forecasting, but note that, once forecasted balance sheets and income statements have been reformulated along the lines of Chapter 9, the forecast drops out very simply (as laid out at the beginning of the cash flow chapter, Chapter 10). Here students are given the forecasts with actual cash flows, in a hypothetical exercise where we pretend that we are standing at the beginning of 1999 and forecast the actual numbers for 1999-2001. This hypothetical exercise removes any concern about imprecision in forecasting, for we have the actual numbers. Concerns arise as to the validity of the methods, not the ability to forecast cash flows.

Question A: Calculating Free Cash Flow

GAAP statements of cash flow confuse financing with operations. After-tax net interest must be added back to cash from operations, and net investments in securities that absorb excess cash must be added back to cash investments to get cash investment in operations.

Here are the adjustments for Coke (KO):

	1999	2000	2001
Cash flow from operations reported	$3,883	$3,585	$4,110
Net interest payments	$(61)	$113	$(21)
Tax benefit (36%)	22	(39)	(41)	72	8	(13)
Cash from operations	3,844	3,657	4,097
Cash investments reported	$3,421	$1,165	$1,188
Net "investments" (in securities)	(342)	(218)	(1)
Cash investment in operating activities	3,079	947	1,187
Free Cash flow	$ 765	$2,710	$2,910

Here are the adjustments for Home Depot (HD):

Years refer to fiscal year ending January following the year indicated.

	1999	2000	2001
Cash flow from operations reported	$2,446	$2,996	$5,963
Net interest payments	$(11)	$(31)	$(35)
Tax benefit (39%)	4	12	14
	(7)	(19)	(21)
Cash from operations	2,439	2,977	5,942
Cash investments reported	$2,622	$3,530	$3,466
Net "investments"	(2)	(9)	(60)
Cash investment in operation activities	2,620	3,521	3,406
Free Cash flow	$ (181)	$(544)	$2,536

In both cases, net interest is interest payments minus interest income. (Ideally we would like to have cash interest receipts rather than accrual interest income, but cash receipts are rarely reported.) Net "investments" in securities to absorb excess cash is purchases of securities minus proceeds from sale of the securities.

Attentive students might raise the issue of Home Depot's capitalized interest. This leads to a discussion of how GAAP further confuses operating and financing activities – by including interest (a financing expense) as the cost of construction (an operating asset). This issue is best left for later in the course, but note for now that the treatment is difficult to disentangle for, while the adjustment can be made for the uncapitalized interest (as we have done) and depreciated capitalized interest is added back to get cash flow from operations, cash investment includes capitalized interest.

Question B: Valuation from Forecasts

Coke:

With only three years of forecasts, we have a problem calculating a continuing value (CV). But there is some information on the pro forma here: free cash flow is growing at a rate of 2,910/2,710 = 1.074 (7.4%) from 2000 to 2001. Let's suppose that this rate were to continue into the future. The CV based on 2001 free cash flow growing at 7.4% is

$$\text{Continuing value} = \frac{\$2{,}910 \times 1.074}{1.09 - 1.074} = \$195{,}334$$

Alternatively, as investment can affect the growth in free cash flow, we might base the growth rate on the average growth rate of cash from operations over the three years, about 3%;

$$\text{Continuing value} = \frac{\$2{,}910 \times 1.03}{1.09 - 1.03} = \$49{,}995$$

Emphasize to students that we are very much speculating about long-term growth rates here. The financial statement analysis in Part II of the book is designed to give us a better handle on growth rates (and thus reduce the speculation).

The valuation of Coke under the first CV calculation is:

PV of 1999 cash flow	\$765/1.09	\$ 702

PV of 2000 cash flow	2,710/1.188	2,281
PV of 2001 cash flow	2,910/1.295	2,247
PV of CV	195,334/1.295	150,837
Value of operations		156,067
Value of net debt (book value)		1,427
Value of equity		154,640
Value per share (on 2,465 million shares)		$62.73

The value of net debt is the debt minus investment in debt securities. Book value approximates market value.

The value of the equity is a little less than the market price of $67. The market is pricing Coke as if it expects free cash flow to grow at more than a 7.4% rate after 2001. The student can test the sensitivity of the valuation to a different cost of capital. Coca Cola uses 9% internally as a hurdle rate for investment in operations.

Clearly we do not have much information here for assessing the growth rate. If one used the CV with a 3% growth rate, the value would be considerably lower. [At this point discuss how further information and further pro forma analysis of Coke (sales growth, margins, etc.) would help with formulating a growth rate.] But the point is that we at least have a starting point to investigate different scenarios. The DCF model looks like something we can work with. Indeed, if we deemed that a 7.4% growth rate (in perpetuity) is excessive (it is high!) and understand that the market is forecasting an even higher rate, we may well conclude that Coke is overvalued, and need proceed no further. Indeed, 1999 was a bubble period during which we may well have been skeptical about valuations of such a "hot stock." By 2001, after the 2001 report here was published, Coke was trading at $45.

Home Depot:

While the DCF model got us some insights into the valuation of Coca Cola, not so Home Depot. Don't even try to go through the mechanics of calculating the free cash flows for HD. Free cash flows are negative for 1999 and 2000. If you go back in time prior to 1999, you will see that Home Depot's free cash flows have been negative: - $376 million, -$347 million, and -$15 million, in 1999, 1998, and 1997, respectively. Free cash flows are positive for 2001, but the contributing factor is the large increase in accounts payable and accrued liabilities of $2,078 million. Would we base a continuing value on a firm slowing its payments to creditors for one period (which probably cannot be sustained)?

Discussion

The chief discussion point of the case is the concept behind free cash flows. See that section in the chapter. Free cash flow is a liquidation concept, so that a very profitable firm, like Home Depot, that invests heavily to take advantage of its profit opportunities, has negative free cash flow. HD is similar to the Wal-Mart example in the chapter. A firms that liquidates its investments (possibly destroying value) increases free cash flow. The measure is perverse. It does not capture value added.

At this point, introduce accrual accounting and show how it deals with investment and, in addition, attempts to correct the mismatching of value added and value surrendered that is the problem with free cash flow. Look at the net income foe HD reported at the top of the cash flow statement. These numbers are positive (for a start), but are also growing at a rate that can be a base for forecasting subsequent growth rates. However, to proceed, we require a model that converts earnings forecasts to a valuation.