CHAPTER FOUR

DEFINING AND ESTIMATING THE FUTURE BENEFIT STREAM

"Business without profit is not business anymore than a pickle is a candy."
Charles F. Abbott

Practice Pointer

In this chapter, we will discuss the following:

- **Selecting and measuring the type of future benefits to be valued**
- **Distinguishing cash flows to equity from cash flows to invested capital**
- **Forecasting future economic benefits**

After completing the financial analysis of the company, normalizing the historical earnings, analyzing the economic and industry conditions and forecasts and evaluating the internal and external risk factors of the company, the analyst is in a position to derive the estimate or conclusion of value. The following issues are addressed to derive estimate or conclusion of value:

- How will we define and measure the future benefit stream to be used in valuing the company?
- Will we use "historical" or "projected" economic income to estimate or project the future benefit stream?
- Will we be projecting future benefits to equity, or to the entire company (invested capital)?

I. DEFINING AND MEASURING THE FUTURE BENEFIT STREAM

To answer the first question above, the valuation analyst will consider the following:

A. NATURE OF BUSINESS INTEREST BEING VALUED; CONTROLLING VS NON-CONTROLLING

The type of benefits may depend on the nature of the interest being valued. The estimated future benefit stream may be representative of a "controlling" interest benefit stream or a "non-controlling" interest benefit stream. The analyst must understand the correlation between the nature of the interest and the corresponding benefit stream. Capitalizing or discounting a controlling interest benefit stream will result in a "controlling interest value." Correspondingly, capitalizing or discounting a non-controlling interest benefit stream will result in a "non-controlling interest value."

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Further, the type of benefits may depend on whether the nature of the interest being valued is an equity interest, invested capital, intangible asset, tangible asset, etc. The type of benefit needs to correspond to the interest having access to the benefit. For example:

1. Net cash flow to equity will result in the value of the equity
2. Net cash flow to invested capital will result in the value of the invested capital

B. PURPOSE OF THE VALUATION

The type of benefits is often defined or suggested, based on the purpose of the valuation (refer to the various purposes of valuations discussed in Chapter One). It is often the case that the parties seeking the valuation define the type of benefits to be used in a valuation. Such would be the case if you were asked to estimate the value of a business based on an established buy-sell agreement which defined the type of earnings to be employed in the valuation. For litigation purposes, state law may define the type of benefits. For transactional purposes, the type of benefits may be defined by parameters used to develop the market multiples.

C. METHOD USED TO SUPPORT THE ESTIMATE OR CONCLUSION OF VALUE

In some cases the type of earnings is defined by the method used in estimating the value of the business (see Chapter Six). For example, the type of earnings used with the Price Earnings Ratio Method or the Dividend Paying Capacity Method is the net income of the company. When using the Capitalization of Earnings Method or Excess Earnings Return on Assets over Reasonable Rate Method, the type of earnings used could be either net cash flow to equity, net income before tax or net income after-tax, as long as your capitalization rate is consistent with the type of earnings used.

The type of earnings generally used in the Discounted Economic Income Method (also referred to as the Discounted Future Earnings or Discounted Cash Flows) is Net Cash Flow to Equity or Net Cash Flow to Invested Capital. Net Income Before Tax or Net Income After-tax is usually the type of earnings used with the Excess Earnings Return on Assets (Treasury Method) as long as the rate of return on assets is based on the same type of earnings. For example, if the rate of return on assets is based on Net Income Before Taxes, then the valuator should use the same type of earnings.

D. NET CASH FLOWS VS. GAAP EARNINGS

When using an income approach, some valuators prefer net cash flows as the type of earnings to use as a measurement of economic income. The reasons net cash flows are generally preferred are:

1. Net cash flows represent the type of earnings most investors are seeking and expect to receive from their investments.
2. Most of the cost of capital derived from the capital markets and other empirical data that is used to derive the discount rate represents net cash flows as the type of earnings to measure economic income. For example, the data used in the Ibbotson Build-up Method to derive the discount rate is based on net cash flows as the measurement of economic income.
3. Net cash flows bring into the income approach the expected future changes in the balance sheet. Net cash flows will take into consideration the future expected working capital needs, capital expenditures, and changes in long-term debt necessary to support the projected earnings of the company.

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GAAP earnings (or net income) are sometimes used as the type of benefits to measure economic income when the valuation analyst expects the future earnings will approximate the future net cash flows. Normally, this will be the case when the capital expenditures, net working capital requirements and changes in long-term debt to support the company's projected operations are insignificant in relationship to the earnings. In addition, even when capital expenditures are significant, this will be the case when depreciation expense approximates capital expenditures.

When determining whether to use net cash flows or net income, the analyst needs to carefully analyze the future expected trend in earnings and cash flows. The analyst must determine the future working capital needs, capital expenditures, and borrowings and repayments of long-term debt to support the expected future operations in order to determine the economic benefits available to the equity holder. If earnings are used, the analyst needs to explain in the report why he/she expects the future earnings will approximate the future cash flows of the company. Or when using net income as your measure of economic income, the valuator may convert the discount/capitalization rate derived from net cash flow data by the cash to earnings factor, if material (see Chapter Five).

E. OTHER TYPES OF EARNINGS

Other benefits streams used as a measurement of economic income include earnings before interest and taxes (EBIT), earnings before interest, taxes, depreciation and amortization (EBITDA), seller's discretionary cash flow, operating gross cash flows, free cash flows, etc. These types of benefits are generally used as a measurement of economic income when applying a market approach. This is because these types of benefits are generally capitalized based on pricing multiples derived from transactional data of comparable companies (see Chapter Six).

F. SELECTING THE TYPE OF BENEFITS AS A MEASUREMENT OF ECONOMIC INCOME

Practice Pointer

It is important to distinguish net cash flow to equity from net cash flow to invested capital and understand which is most appropriate.

Net cash flow to equity is also referred to as the Direct Equity Method. It is "direct to equity" because debt has been serviced (in the calculation below, net income is derived after subtracting both interest expense, and future debt repayments). Hence, what remains is net cash flows available to equity owners.

Net cash flow to invested capital is also referred to as the Invested Capital Method. This is the cash flow available to service invested capital (e.g., equity and interest bearing debt).

As indicated above, net cash flows are generally preferred by most valuators as the type of benefits used as a measurement of economic income. This is true whether using net cash flows to value the equity only or net cash flows to invested capital to value the total invested capital.

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1. Net Cash Flow to Equity

In valuing equity by either discounting or capitalizing expected cash flows (keeping in mind the difference between discounting and capitalizing), we define net cash flow to equity as follows:

	Net Income (after-tax)
+	Non-cash charges (e.g., depreciation, amortization, deferred revenue, deferred taxes)
–	Capital expenditures necessary to support projected operations
–	Additions (deletions) to net working capital necessary to support projected operations
+	Changes in long-term debt from borrowings necessary to support projected operations
–	Changes in long-term debt for repayments necessary to support projected operations
=	**Net cash flow to equity**
–	**Dividends paid to preferred shareholders**
=	**Net cash flow to common shareholders' equity (after-tax)**

2. Net Cash Flow to Invested Capital

In valuing the entire **invested capital** of a company, project, or division by discounting or capitalizing expected cash flows, we define net cash flow to invested capital as follows:

	Net income (after-tax)
+	Non-cash charges (e.g., depreciation, amortization, deferred revenue, deferred taxes)
–	Capital expenditures necessary to support projected operations
–	Additions (deletions) to net working capital necessary to support projected operations
+	Interest expense net of the tax benefit resulting from interest as a tax deductible expense
=	**Net cash flow to invested capital (after-tax)**

Practice Pointer

When discounting net cash flow to equity, the appropriate discount rate is the cost of equity.
When discounting net cash flow to invested capital, the appropriate discount rate is the weighted average cost of capital (WACC).

When calculating the net cash flows, the analyst must determine the components of cash flows based on the cash flows necessary to support projected operations. Analysts commonly make mistakes when the components of cash flows are determined based on historical data. The analyst must base the non-cash charges, capital expenditures, net working capital and long-term debt borrowings and repayments on the cash flow necessary to support the projected operations.

For example, if the company needs to expand its facilities, upgrade equipment, invest in new technologies, expand their distribution network, increase working capital to correct current working capital deficiencies or support anticipated growth, borrow debt to finance capital expenditures, repay current debt obligations as well as anticipated future borrowings, etc., the components of net cash flow need to adequately reflect the expected levels of operations and capital requirements to support the estimated future benefit stream.

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When valuing an equity interest, the valuation analyst will generally use the net cash flow to equity as the type of benefit used as a measurement of economic income.

EXAMPLE ONE: NET CASH FLOW TO EQUITY

Net income (after-tax)	$500,000
Non-cash charges (e.g., depreciation, amortization, deferred revenue, deferred taxes)	200,000
Capital expenditures necessary to support projected operations	–150,000
Additions to net working capital necessary to support projected operations	– 70,000
Changes in long-term debt from borrowing necessary to support projected operations	95,000
Changes in long-term debt for repayments necessary to support projected operations	–95,000
Net cash flow to equity	480,000
Divided by: After-tax net cash flow to equity capitalization rate	÷ 20%
Value of equity capital	**$2,400,000**

However, in cases where the capital structure of the company is significantly different from the capital structures of the comparable industry or capital markets used to derive the discount/capitalization rate, the analyst should consider using the net cash flow to invested capital as a measurement of economic income. When using net cash flow to invested capital to value equity capital, the analyst will need to consider the weighted cost of capital for all types of invested capital and deduct the firm's actual debt capital from the total invested capital to arrive at the value of the equity capital. For companies that are highly leveraged or those with little to no debt, the analyst should consider selecting net cash flow to invested capital as the type of benefits to adequately consider the capital structure.

EXAMPLE TWO: NET CASH FLOW TO INVESTED CAPITAL

Net income (after-tax)	$ 500,000
Non-cash charges (e.g., depreciation, amortization, deferred revenue, deferred taxes)	200,000
Capital expenditures necessary to support projected operations	–150,000
Changes to net working capital necessary to support projected operations	– 70,000
Interest expense (net of the tax benefit)	45,000
Net cash flow to invested capital	525,000
Divided by: weighted average cost of capital (WACC)[1]	÷ 15.44%
Value of invested capital	3,400,000
Less debt capital (interest bearing debt)	–1,000,000
Value of equity capital	**$2,400,000**

If earnings are selected as the type of benefits used to measure economic income, the analyst must have determined and documented that the future earnings and net cash flows are approximately the same or that the discount/capitalization rate has been converted by the cash to earnings factor. The types of earnings to choose from include, but are not limited to, the following:

[1] The WAAC is based on $1,000,000 of debt with an after-tax cost of 4.50% and $2,400,000 of equity with a cost of 20%.

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a) Income from operations
b) Income before taxes
c) Net income (after-tax)

The type of earnings to use will generally depend upon which level of earnings the analyst believes provides the greatest level of stability and reliability. Many valuation analysts prefer to use income from operations because they believe this type of earnings is the most stable and reliable level of earnings of the company. In any case, the discount/capitalization rate must be consistent with the type of earnings.

Practice Pointer

If pre-tax earnings are used, then the discount/capitalization rate must be on a pre-tax basis. Correspondingly, if after-tax earnings are used, then the discount/capitalization rate must be on an after-tax basis.

II. USING HISTORICAL VS. PROJECTED ECONOMIC INCOME TO ESTIMATE FUTURE BENEFITS

Is the historical economic income indicative of the future or are projections best suited to estimate future benefits? Whether to use the historical economic income or projected economic income depends on the valuator's analysis of the company's expected future operations. The analyst should consider the purpose for the valuation; history of the company, management's expected future operations, the economic and industry conditions and forecasts, external and internal factors that have an effect on the future benefit stream and the trend of historical economic income.

A. PURPOSE OF THE VALUATION

The purpose for the valuation may suggest whether or not it is appropriate to use historical vs. projected economic income. Historical economic income is generally used to estimate future benefits for tax, buy-sell, and divorce valuations because the historical data is based on fact and hence considered more reliable.

Projected economic income, however, is used for both tax or non-tax valuations including litigation matters, ESOPs and transactional valuations because the projected income may be more representative of the expected future results.

In litigation, the state law or jurisdiction may require or suggest the use of historical data or projected data. When valuing a company for transactional purposes, projected economic income may be needed to properly reflect the future operations associated with expected changes in the operations.

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B. OTHER FACTORS TO BE CONSIDERED

1. In Addition to the Purpose of the Valuation, Other Important Questions/Factors to Be Considered Include:

a) Is the historical data representative of anticipated future operations?
b) Has the company significantly changed its product lines, locations, facilities, operating entities, market share, distribution channels, etc?
c) Is the company new and emerging, growing or a mature business?
d) What are management's expectations for growth, expansion, downsizing, market share, competition, changes in product lines, pricing, product development, etc?
e) How do the company's expectations compare to the historical data?
f) Are projections required to properly reflect the changes anticipated by management?
g) How will management's expectations affect the future capital requirements, capital expenditures, profitability, working capital requirements, etc?
h) What changes are occurring in the industry?
i) Is the industry going through consolidations, regulatory changes, technology changes, distribution changes, competitive pressures, etc?
j) How will the anticipated changes in the industry affect the company's estimated future benefit stream?
k) How will expected changes in the industry affect the company's expected capital expenditures, profitability, working capital needs, etc?
l) What is the economic forecast, locally, regionally, and nationally, and how will the economic forecast affect the estimated future benefits of the company?

2. Generally, Estimated Future Benefits are Based on Historical Economic Income When:

a) The purpose for the valuation is tax or divorce. Historical economic income is based on fact and thus considered more reliable than projected economic income (the above is a generalization and readers must refer to state case law and the appropriate statute!)
b) Historical economic income is indicative of expected future benefits based on the stability and trend of historical earnings
c) Company is mature
d) Historical operations are a good proxy for the future
e) Future benefit stream is linear

3. Generally, Estimated Future Benefits are Based on Projected Economic Income When:

a) Projected economic income may be considered more representative of the future whether or not the valuation is for tax or non-tax purposes
b) Projections are available and are considered indicative of the expected future benefits
c) Lack of reliable historical data
d) Emerging businesses
e) Start-up development stage enterprises
f) Future benefit stream is non-linear

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Observation

Linear vs. non-linear benefit stream. A linear benefit stream is a stream of future benefits that is expected to remain constant or grow/decline at a constant rate. A non-linear benefit stream is a stream of future benefits that is expected to grow or decline at a variable rate. Historical economic income is used when estimated future benefits are expected to be linear. Projected economic income is used when estimated future benefits are expected to be non-linear (subject to any restrictions based on the purpose of the engagement).

Ultimately, the analyst will use his or her financial analysis, management inquires and economic/industry research to ascertain whether the historical data is the best indication of the future benefit stream or whether projections are required to estimate future benefits.

III. METHODS USED TO CALCULATE THE ESTIMATED FUTURE BENEFITS

Practice Pointer

In this section, four different ways of projecting future benefits are presented. There is no best practice or preferred method to project future benefits. The analyst must rely on professional judgment.

Once the valuation analyst has adjusted the historical income statements to an economic/normalized basis and has defined the type of earnings that will be used, then an estimate of the expected future benefits must be made. The methods used to calculate the estimated future benefits depend on whether the expected future benefit stream is linear or non-linear.

A. LINEAR BENEFIT STREAM ASSUMPTION

A benefit stream is linear when the estimated future benefits are expected to remain constant or grow or decline at a constant rate. Normally, historical economic income is used to estimate a linear benefit stream. Two of the most commonly used methods to estimate future benefits based on historical economic income are:

- Unweighted Average Method
- Weighted Average Method

These methods are used when capitalizing future benefits.

Many valuation software packages[2] will automatically calculate these methods. We discuss them in detail here so the analyst will understand what the software is doing and will select the most appropriate method.

[2] Including NACVA's BVMPro

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- What is An Adequate Number of Historical Years to Use to Estimate Future Benefits?

An adequate number of historical years to estimate future benefits depends on the business cycle of the company and the number of years are indicative of the projected operations. Many industries have a business cycle that is representative of a repetitive cycle of peaks and valleys in operations. In these cases, the valuator should always attempt to obtain an adequate number of years to represent the business cycle. For businesses where a distinct business cycle is not evident, the valuator should obtain all years that are representative of projected operations. Generally, valuation analysts prefer to use five to seven years worth of historical data to adequately cover the effects of internal and external factors that would be expected to continue in the future.

1. Unweighted Average Method

The method of averaging historical economic income to determine the estimated future benefit stream is not in and of itself a methodology that will determine the appropriate future benefits. The analyst must first determine that an average of the historical economic income serves as a good proxy of the future expected benefits. Whether to use weighted or unweighted averages of the historical economic income depends on the relative representation of each year's historical economic income or the trend in historical economic income to the future expected benefits. An unweighted average method is typically used when the analyst concludes all of the past earnings are representative of the expected future benefits and no existing pattern or trend would suggest that any one year or years results are any more indicative than the rest of the historical data. A weighted average method is typically used when the analyst concludes certain past earnings are more representative of the expected future results or the historical earnings demonstrate a trend that is expected to continue in the future.

The unweighted average method, sometimes referred to as the "average method" of estimating expected future earnings, is based on the simple average or arithmetical mean of the historical economic earnings, which is calculated by taking the sum of a set of values and dividing the sum by the number of values used in deriving the sum.

$$\frac{\text{Sum of Variables}}{\text{Number of Variables}}$$

The unweighted average of the historical economic earnings is most appropriately used for estimating the amount of future earnings when there is no apparent pattern or trend in the past earnings history, or if it appears an existing pattern cannot be reasonably expected to continue. Generally, this method would be used for companies that are mature and earnings are constant or represent a business cycle of peaks and valleys that are expected to continue.

In other words, the analyst has not discovered any information or data, which would lead to the belief any one of the years in the analysis, is more or less typical of the future.

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Example:

Assume ABC Company has the following economic/normalized net cash flows to equity over the last five years.

5th prior year	$120,100
4th prior year	– 25,600
3rd prior year	– 12,300
2nd prior year	57,900
Prior year	10,700
Total	$150,800

$150,800 ÷ 5 = $30,160 Unweighted Average*

*This is the estimated amount of future earnings under this method.

2. Weighted Average Method

The weighted average method is used when the analyst concludes one or more of the historical years are more representative of the future estimated benefits or that a trend or pattern exists and is expected to continue. The weighted average method of estimating the expected future benefit stream is based on the average or arithmetical mean. Taking the sum of a set of values that has been multiplied by some index or weighting factor calculates this. Then the sum of these products is divided by the sum of the weights.

$$\frac{ew_1 + ew_2 + ew_n}{w_1 + w_2 + w_n} \qquad \frac{e = \text{earnings in a given period}}{w_1\ w_n = \text{weight factor assigned}}$$

The weighted average of historical economic earnings is most appropriately used for calculating future earnings when there appears to be a general pattern that may be extrapolated into the future. The pattern may be positive or negative. Generally the analyst applies a heavier weight to the most recent year's earnings and a lesser weight to the earlier years.

The analyst should be careful in applying weights and implying that if a year has a heavier weighting, it is more indicative of the future. This may lead the reader to believe the analyst knows more about the future than is the case. In the event the analyst places a disproportionate weight on any particular year or years, the analyst should explain in the report the rationale for the weighting.

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Example:

Assume Baker Company had the following economic/normalized net cash flows to equity over the last six years.

6th prior year	$115,700
5th prior year	135,900
4th prior year	117,800
3rd prior year	160,500
2nd prior year	122,300
Prior year	175,000

Calculated weighted average

$115,700	x	1	=	$ 115,700
$135,900	x	2	=	$ 271,800
$117,800	x	3	=	$ 353,400
$160,500	x	4	=	$ 642,000
$122,300	x	5	=	$ 611,500
$175,000	x	6	=	$1,050,000
Total		21		$3,044,400

$3,044,400 ÷ 21 = $144,971 Weighted Average *

* This is the estimated amount of future earnings under this method.

Even though cash flows have fluctuated each year, there appears to be a general upward trend. As such, it appears appropriate to use the weighted average method by placing greater weight on each of the new years of increasing cash flows.

B. NON-LINEAR BENEFIT STREAM ASSUMPTION

A benefit stream is non-linear when the estimated future benefits are expected to grow or decline at a variable rate. Normally, projected economic income is used to estimate a non-linear benefit stream. Two of the most commonly used methods to estimate future benefits based on projected economic income are:

- Projected Cash Flows
- Projected Earnings

These methods are used to estimate future benefits when discounting future benefits.

1. Projected Cash Flows (Discounted Cash Flow Method)

The analyst will project the specific cash flows over a number of years representative of the period in which the benefit stream is expected to vary followed by a terminal value. The terminal value is representative of the capitalized economic income once the benefit stream stabilizes, remains constant or grows or declines at a constant rate.

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Generally, the analyst will project the cash flows with an adequate level of detail that will explain the projected operations and anticipated changes in the business. The key assumptions to the projected cash flows should be included in the report. (See example in Table 4–1.)

TABLE 4–1. EXAMPLE OF PROJECTED CASH FLOWS (DISCOUNTED CASH FLOW METHOD) (IN $,000)

	Year 1	Year 2	Year 3	Year 4	Year 5	Thereafter
Sales	$ 10,000	$ 10,500	$ 11,550	$ 12,350	$ 12,720	
Cost of sales	6,000	6,300	6,930	7,410	7,630	
Gross profit	4,000	4,200	4,620	4,940	5,090	
Operating expenses	2,050	2,120	2,300	2,400	2,450	
Income from operations	1,950	2,080	2,320	2,540	2,640	
Other income/expense	20	20	20	20	20	
EBIT	1,970	2,100	2,340	2,560	2,660	
Interest expense	280	250	210	170	130	
Income before tax	1,690	1,850	2,130	2,390	2,530	
Income taxes	680	740	850	960	1,010	
Net income	1,010	1,110	1,280	1,430	1,520	
Non-cash charges	200	200	200	200	200	
Capital expenditures	(150)	(500)	(50)	(300)	(50)	
Working capital	(100)	(100)	(100)	(100)	(70)	
L/T debt	(450)	(490)	(520)	(560)	(610)	
Net cash flow to equity	510	220	810	670	990	1,020
Capitalization rate						22.0%
Terminal value						4,636
Discount rate (25%)	0.800	0.640	0.512	0.410	0.328	0.328
Net present value	**$ 408**	**$ 141**	**$ 415**	**$ 275**	**$ 325**	**$ 1,521**
Equity value	**$ 3,085**					

Note: Discount rate is 25%, growth rate after Year 5 is 3%, and capitalization rate of terminal value is 22%. Each year's present value factor is calculated as $1/(1+i)^N$, where i equals the discount rate and n equals the number of years until the future benefit (net cash flow in this case) will be received.

2. Projected Earnings

The process for projecting earnings would be similar to the process described above for projecting cash flows. Projected earnings can be used when the projected earnings are expected to approximate the projected cash flows or when the discount rate has been converted by cash to earnings factor.

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C. OTHER METHODS USED TO PROJECT ECONOMIC EARNINGS

The following are other methods used to project economic earnings:

1. Trend-Line Static Method:

   The trend-line static method often puts a heavier weighting on the latest year, as does the weighted average method. However, because the trend-line static method is based on least square formulas, it produces a trend line that lessens the impact which any particular year has on the calculation. The trend-line static method assumes a capitalization process of earnings rather than a discounting process

2. Projected Growth Rate in Earnings Method (data is increasing at a constant rate)
3. Trend-line Projected Method (data is increasing at a declining rate)
4. Geometric (data is increasing at an increasing rate)
5. Logarithmic (data is increasing but at an increasingly declining rate)
6. The Gompertz Curve (slow growth followed by rapid growth followed by slowing of growth and then a declining growth rate)
7. Internal Growth (return on equity times (1–p) where p refers to the proportion of earnings paid out in the form of dividends)

Regardless of the method, the analyst must decide how to handle years with negative earnings or cash flows.

A detailed explanation of other methods used to project economic earnings can be found in Appendix VIII and statistics books, along with explanations on how and why variables are used, important assumptions and the strengths and weaknesses of each calculation type.

D. THE CONCEPT OF FREE CASH FLOW

Valuation analysts should also familiarize themselves with the concept of free cash flow (FCF). In theory, FCF provides a measure of the cash available to the company for discretionary uses after deducting the funds needed to continue operating at a planned level. One issue that arises is the scarcity of guidance regarding what constitutes "required" and "discretionary" uses.

Generally speaking, "discretionary" uses are comprised of:

- Growth oriented capital expenditures and acquisitions
- Debt principal reduction
- Shareholder payments (dividends, stock repurchase)

E. OTHER CONSIDERATIONS USED TO CALCULATE FUTURE BENEFITS

1. What is an adequate number of projected years to use to estimate future benefits?

   There is no correct answer to how many years the economic income should be projected. Generally, the economic income will be projected over as many years as necessary until the benefit stream stabilizes and becomes linear (increasing or decreasing at a constant rate into perpetuity). Once the benefit stream stabilizes and becomes linear, the analyst can capitalize the remaining benefit stream into one number representing the terminal value (See Chapter Six). The analyst must use his or her professional judgment to project the economic income over a period that can be reasonably predicted. Usually, the level of reliability declines the longer the projection period. The valuator should factor the level of reliability for the projection into the discount rate. A CPA may be required to issue a compilation report when using some kinds of projections. Check with the appropriate governing society before issuing the valuation report.

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2. Should the projected economic income be in constant real dollars or nominal dollars?

   The analyst can prepare the projected economic income in constant real dollars, where the projected economic income is based on the dollars in the first year without regard to inflation, or in nominal dollars, where an estimate of inflation is included in the projected economic income over the projection period. However, whether the analyst chooses constant dollars or inflation-adjusted dollars, they must select the appropriate present value discount rate that corresponds to the economic basis used to project the benefit stream (see Chapter Five).

3. Who should prepare the projections?

   Whether the company prepares the projections or whether the analyst prepares the projections with the assistance of management, the analyst needs to evaluate the projections for reasonableness and to determine that the projections properly reflect expected future operations, the economic and industry forecast and the external and internal factors that are expected to affect the future benefit stream. The analyst should assess the reliability of the projections and consider providing for any additional risks in the discount rate.

IV. VALIDATING YOUR CALCULATION OF ESTIMATED FUTURE BENEFITS

A. REVIEW CHECKLIST AND GENERAL CONSIDERATIONS

The analyst should consider the following steps as a review of the calculation of the estimated future benefits:

1. Graph the historical economic income and the estimated future benefits. Review the graph to determine whether the method used to determine the estimated future benefits is consistent with the trend.
2. Does the type of future benefits selected correspond with the purpose for the valuation?
3. Does the method used to estimate future benefits appropriately represent the projected operations?
4. Does the projected future benefit stream reflect management's expectation for future operations?
5. Does the projected future benefit stream reflect industry conditions and forecast?
6. Do the estimated future benefits reflect the capital expenditures needed to support the projected operations?
7. Do the estimated future benefits reflect the additional working capital needed to support the projected operations?
8. Do the estimated future benefits reflect the debt borrowings and repayments to support the projected operations?
9. If earnings are used as the type of benefits, do the earnings approximate the cash flows or has the capitalization/discount rate been adjusted accordingly?
10. Does the type of benefits selected correspond to the nature of the interest being valued?
11. Does the capitalization/discount rate match the type of benefit stream?

B. CORRELATION ANALYSIS

Certain professionals have advocated the use of correlation analysis as a more objective tool in the process of selecting the most appropriate method for determining estimated future benefits. The correlation coefficient (r) and the coefficient of determination (r^2) are two statistically derived values that can be used to assist the analyst in making a projection method selection. A detailed explanation of the use of correlation analysis can be found in Appendix VIII, based on an article by Robert L. Green, CPA, CVA, CFE, Using Correlation Analysis in Determining Proper Method to Project Earnings, The Valuation Examiner®, 1st Quarter 1994.

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C. VALIDITY OF HISTORICAL DATA

It is important to consider also the quality and quantity of data available as the historical input to the estimation equation of any type.

Quality—obviously any method of estimation is faulty if the information is invalid or questionable. Any estimation method produces riskier output when the input is questionable. The analyst needs to thoroughly understand the financial information and determine the quality of the data. If the quality of the data is questionable and the analyst is unable to make the appropriate adjustments to increase the reliability, the analyst should consider the additional risk in the development of the discount rate, or withdraw from the engagement.

Quantity—when only a few years of historical data are available as a foundation for an estimation of future events, then the degree of confidence that can be placed in those estimates is reduced. When only one or two years of historical economic income exist, the analyst must determine whether the data is indicative of projected operations. If the historical economic income is inadequate to estimate future benefits, the analyst should consider projecting future benefits. When fewer than five years of data are available, it is difficult to justify an estimation method other than unweighted or weighted average methods. If at least five years of data are available, the analyst may consider using the trend-line static method as well as the unweighted or weighted average methods.

All of the projection approaches described are more easily calculated using certain financial calculators or custom software, each having the formulae or algorithms already built in. Always have a clear understanding of the methodologies, check your formulas and calculations and be able to explain the theory and methodology used in the calculation.

In addition to the foregoing chapter of Fundamentals, Techniques and Theory, there are other sources of information which many professionals in the valuation business have read and/or added to their library. The valuation analyst, progressing through the steps in a valuation, should be generally familiar with the body of knowledge represented by this text and other publications. These can include books, papers, articles, seminars, classes and the experience of a valuation mentor or other business mentor the valuator may know. Those at the top of the field continue to grow.

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Recommended reading includes, but is not limited to:

- Abrams, Jay B., *Quantitative Business Valuation*, Part I (Forecasting Cash Flows).
- Campbell, Ian R., and Howard E. Johnson, *The Valuation of Business Interests*, Chapter 4 (Capitalization of Discretionary Cash Flow Methodology), Chapter 5 (Discounted Cash Flow Methodology).
- Damodaran, Aswath, *Damodaran on Valuation*, Security Analysis for Investment and Corporate Finance, Chapter 5 (Estimation of Growth Rates), Chapters 7 & 8 (Free-cash Flow to Equity).
- Copeland, Tom, etal., Valuation *Measuring and Managing the Value of Companies*.
- Green, Robert, "The Income Approach – Net Income Versus Cash Flow?" *The Valuation Examiner*, July/August 2001.
- Helfert, Erich, *Techniques of Financial Analysis*, Chapter 4 (Projection of Financial Requirements), Chapter 5 (Dynamics and Growth of the Business System), Chapter 6 (Cash Flows and the Time Value of Money).
- Hitchner, James R., *Financial Valuation Applications and Models*, Chapter 4 (Income Approach).
- Kasper, Larry J., *Business Valuations: Advanced Topics*, Chapter 2 (Calculate the Current Value).
- King, Alfred, *Valuation: What Assets Are Really Worth*, Chapter 9 (What Will Happen in the Future?)
- Norton, George M., *Valuation Maximizing Corporate Wealth*, Chapter 2 (Calculate Current Value).
- Pratt, Shannon P., R. F. Reilly and R. P. Schweihs, *Valuing a Business, The Analysis and Appraisal of Closely Held Companies*, Part III (Business Valuation Approaches and Methods).
- Pratt, Shannon, *Cost of Capital Estimating and Applications*, Part I (Cost of Capital Basics).

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BUSINESS VALUATIONS: FUNDAMENTALS, TECHNIQUES AND THEORY (FT&T)

CHAPTER 4

REVIEW QUESTIONS

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FT&T

CHAPTER REVIEW QUESTIONS

Chapter 4: Defining and Estimating the Future Benefit Stream

1. Cash flows that are calculated as: net income after tax plus non-cash charges, less applicable capital expenditures, less additions to net working capital to support operations, plus changes in long-term debt from borrowings required for operations, less changes in long-term debt for repayments:

   a. Equals net cash flow to equity
   b. Equals equity to debt ratio
   c. Equals invested equity
   d. Equals operations equity

2. The formula for net cash flow to invested capital can be calculated as:

   a. Net income before tax, plus non-cash charges, less capital expenditures, less additions to net working capital for operations, less interest expense (tax-affected)
   b. Net income after tax, plus non-cash charges, less capital expenditures, less additions to net working capital for operations, plus interest expense (tax-affected)
   c. Net income after tax, plus non-cash charges, less capital expenditures, less additions to net working capital for operations, less interest expense (tax-affected)
   d. Net income after tax, plus non-cash charges, plus capital expenditures, plus additions to net working capital for operations, less interest expense (tax-affected)

3. Bell Landscape Company has the following historical earnings:

Year	Earnings
1	$75,400
2	65,200
3	87,600
4	90,500
5	53,900

   Which method of projecting earnings would appear most appropriate to estimate future benefits?

   a. Weighted average method
   b. Unweighted average method
   c. Trend Line—static method
   d. Gompertz curve method

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4. Using the data provided above in question 3 for Bell Landscape, estimate the future benefits, using the method you have selected in question 3:

   a. $73,340
   b. $75,700
   c. $93,150
   d. $74,520

5. Start-up Jennings Baker Company provided you the following historical data:

Year	Earnings
1	($15,300)
2	32,400
3	89,600

   Which method of projecting earnings would appear most appropriate to estimate future benefits?

   a. Weighted average method
   b. Unweighted average method
   c. Trend Line—static method
   d. Gompertz curve method

6. Net cash flow to equity will result in what type of value?

   a. Invested capital
   b. Equity
   c. Controlling interest
   d. Non-controlling (i.e., minority) interest

7. When discounting cash flow to invested capital, the appropriate discount rate is:

   a. Cost of equity
   b. Weighted average cost of capital
   c. Capital asset pricing model
   d. Ibbotson build-up method

8. Generally, an estimated future benefit stream is based on historical economic income when:

   a. There is a lack of historical information
   b. Start up or development stage companies
   c. The future benefit stream is estimated to be non-linear
   d. The future benefit stream is estimated to be linear

9. A linear benefit stream is a stream of future benefits that is expected to grow or decline at a variable rate.

   a. True
   b. False

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10. Two most commonly used methods to estimate future benefits based on a linear benefit stream are:

    a. Weighted average method and unweighted average method
    b. Weighted average method and projected cash flow method
    c. Unweighted average method and projected cash flow method
    d. Projected cash flow method and projected earnings method

11. Using a weighted average method to determine a future benefit stream, a valuation analyst assigns more weight to the most recent years. This indicates:

    a. The valuation analyst determined the most recent year is the most indicative of future years
    b. All of the past earnings are representative of the expected future benefits
    c. No existing pattern or trend would suggest that any one year or years is more indicative than the rest of the historical data
    d. There is no apparent trend in the historical earnings

12. Using the Trend Line Projected Method, growth or data is:

    a. Increasing at a declining rate
    b. Increasing at an increasing rate
    c. Increasing at a constant rate
    d. Increasing at an increasingly declining rate

13. Projected economic income in constant real dollars is based on real dollars in the first year without regard for inflation.

    a. True
    b. False

14. When utilizing projected or forecasted financial information, the adequate number of years to be included in the analysis is:

    a. 5 years for tax valuation per the Internal Revenue Service, 10 years for all other types of valuations
    b. A minimum of 10 years for all valuations
    c. Number of years based on the owner's investment horizon.
    d. The number of years until it is assumed the benefit stream becomes linear

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Chapter 4 Bonus Question:

Calculate the equity value using net cash flows to equity as the benefit stream. Assume a 20% after–tax net cash flow capitalization rate and a 15.58% weighted average cost of capital. Assume the net income (after–tax) is $500,000. Assume the non-cash charges are $250,000 a year, the expected capital expenditures to support the projected operations is $100,000 a year, the working capital necessary to support the projected operations is $50,000 a year, and the annual debt repayments are $250,000. Assume that the annual interest expense (tax effected) is $140,000 and that the debt capital is $3,000,000.

Net income (after-tax)	$ 500,000
Non-cash charges (e.g. depreciation, amortization, deferred revenue/taxes)	250,000
Capital expenditures necessary to support projected operations	(100,000)
Additions to net working capital necessary to support projected operations	(50,000)
Changes in long-term debt for repayments necessary to support projected operations	(250,000)
Net cash flow to equity	350,000
After-tax net cash flow capitalization rate	20%
Equity value	$1,750,000

Assuming the same facts as above, calculate the equity value using the net cash flows to invested capital.

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