

A NEW LOOK AT EXPECTED CASH FLOWS AND PRESENT VALUE DISCOUNTS

By Hal Rosenthal, CPA, CFE

CPAs who calculate the present value of expected cash flows as a basis to determine economic damages, the value of business assets and liabilities or entire businesses are, knowingly or unknowingly, functioning in the realm addressed by FASB Concept Statement No. 7 (Con 7), *Using Cash Flow Information and Present Value in Accounting Measurements*, which deals with measurement of fair value in accounting using present value. The focus of this article is Con 7 in the context of economic damages.

Con 7 defines an "expected cash flow approach" and states a strong preference for using it in performing fair value measurements using uncertain cash flows. Economic damages determinations are often based upon uncertain cash flows. Therefore the expected cash flow approach as defined in Con 7 is applicable to their measurement

There is a recognized problem, however, with the way Con 7 is understood and applied by preparers that impacts both valuations and economic damages determinations.

The purpose of this article is to help bridge the gap between theory and practice in connection with the determination of the present value of expected cash flows, to advocate a practical discipline regarding the use of risk factors for estimating future cash flows and the present value thereof within the framework provided by the "Expected Cash Flow Approach" defined in Con 7, and to disclose the source and nature of a fundamental misconception that leads to overstatement of asset values and economic damages.

The misconception is inherent in

the technique by which many practitioners apply certain risk factors in arriving at the discount rate to compute the present value of anticipated future cash flows (the "Traditional Approach" as defined in Con 7).

How the problem may have come about can in part be expressed by FASB's words in its recent *Fair Value Measurement, Project Update*: "U.S. GAAP does not provide a framework for measuring fair value. Guidance for measuring fair value has evolved over time and is dispersed among the many different accounting pronouncements that require fair value measurements. Differences in that guidance have impeded FASB's efforts to communicate its Con 7 so that it can be generally understood and consistently applied by preparers, valuation specialists and auditors, creating the potential for differences in fair value measurements for the same or similar items under different accounting pronouncements."

TWO DISTINCT METHODOLOGIES

FASB Concept Statement No. 7 addresses two distinct methodologies for the determination of present value of cash flow:

1. The "traditional approach" wherein compensation for all applicable risk factors inherent in a single cash flow projection is reflected in a single discount rate (that is, the risk free rate plus risk factor adjustments).
2. The "expected cash flow approach"
 - a. Risk factors that cause variation to projected cash flows should be considered separately.
 - b. The probability of different cash flows due to applicable unsystematic or subjective risk factors

should be applied in arriving at the expected cash flow or income stream.

c. The expected cash flows should then be adjusted for the systematic risk inherent in them. According to Shannon P. Pratt et al. in *Valuing a Business—The Analysis and Appraisal of Closely Held Companies*, systematic risk is "The uncertainty of future returns due to sensitivity of the return on the subject investment to movements in the return for the *investment market as a whole*." (Emphasis added).

d. The resultant net cash flow or income stream, determined as a result of steps a, b and c, should then be subject to the "safe investment rate" to arrive at the present value.

THE BETTER, SAFER APPROACH

The "expected cash flow approach" is better and safer to use. Since both the expected cash flow approach and the traditional approach are variations of present value, each should, when applied properly, arrive at a similar result. Often, however, a material disparity exists in cash flow determinations derived from applying specific risk considerations to the individual profit and loss line items to which they relate (expected cash flow approach), as compared with inclusion of the same considerations as factors within an undivided, lump sum present value discount rate (traditional approach).

It may seem obvious at first that there is a mathematical difference in the results of a present value calculation developed by including all risk factors in the discount rate as compared with having the same risk factor issue or issues reflected as direct adjustments to the income statement (that is the source of the revenue stream to be brought to present value). Such awareness, however, does not solve the problem. The fact is that both the magnitude and ramifications of such differences are often not fully perceived or adequately considered.

Table 1 is a simplified illustration of one such scenario. The table shows variation of \$264,045 in present value for just a single year, assuming a company expected the sales *prices* (not the sales *volume*, therefore the cost of sales remains unchanged) of \$5,000,000 worth of product to be reduced by 14% because of competition. For purposes of comparison of results, a 14% factor is added to an assumed safe investment rate of 6% in the Traditional Approach column.

In the Table 1 example, as is often the case in the real world, each category of sales, sales price, cost of sales and fixed costs has an individual and distinct existence that must be considered separately in connection with their impact on expected cash flows. One of the first things to be recognized therefore is that the inherent assumption in the Traditional Approach of an “across-the-board” equality of effect on expected cash flow is unwarranted.

Secondly, while published data commonly used in the Traditional Approach may serve as a good checklist of risk factor topics to be considered, application of the numeric values of such published data should not be considered valid without due consideration of comparability with the facts and circumstances of the subject entity. Under the traditional method in the example, it would take a consolidated discount rate exceeding 80% to arrive at the proper result. Such a rate is well beyond the parameters contained in published data commonly used in the Traditional Approach.

In an article published in the *Journal of Accountancy* in January 2002, Robert L. Dunn and Everett P. Harry list nineteen discount rate risk considerations within the following sub-categories that “unsystematic or subjective risk” comprises: market risk, financial risk, management risk, product risk, company sales risk, and business environment risk.

In one way or another, each of

Table 1

| | Traditional | Expected Cash Flow |
|---|------------------|--------------------|
| Sales volume | \$5,000,000 | \$5,000,000 |
| Less: Pricing risk factors (14%) | | (700,000) |
| Adjusted gross sales | \$5,000,000 | \$4,300,000 |
| Cost of sales (75%) | (3,750,000) | (3,750,000) |
| Gross profit | \$1,250,000 | \$550,000 |
| Fixed costs | (500,000) | (500,000) |
| Pre-tax profit | \$750,000 | \$50,000 |
| Present value: Annual convention, five years. | | |
| @ 20% rate | <u>\$301,408</u> | |
| @ 6% rate | | <u>\$37,363</u> |

the listed risks or others as may apply in a particular case can have an impact on one or more income statement individual line items. “Strength of competition,” for example, may lead to increased advertising and promotion costs as well as a reduction in selling prices; “commercial impracticality of production” may result in obtaining product from others at a higher product cost.

There is no formal linkage between published risk factor data used in the traditional approach and the financial realities of an individual company. The analyst must consider applicable business and economic circumstances specific to the entity under review in arriving at projected net cash flows (such business and economic circumstances are here discussed in the form of unsystematic or subjective risk factors). Furthermore, they must be considered in relation to the specific income statement line items to which they apply.

ANALYSIS

Table 2 is provided to demonstrate the relevant mathematics of the expected cash flow approach and to submit a basic calculation format recommended by this writer. It can also serve as a worksheet format to facilitate review by appropriate audit personnel. In that event, full explanation of the listed risk factors as

well as their related probabilities and substantiation thereof would be attached. The table is not intended to represent a trial exhibit.

Hopefully, the data included in an actual analysis will constitute reasonable anticipation of events that potentially may have an impact on the future income stream.

The adjustments result from using risk factors as a checklist to ascertain those risk elements that affect the expected cash flow of the subject entity. The percentages used represent the reasonable possibilities applicable to income statement line items of the subject entity.

The \$89,011 present value amount may serve as an economic damages component in many instances. If, however, the analysis is being used to determine the market value of the business, a further adjustment to the \$119,117 pre-tax profit amount should be considered for systematic risk as required by Con 7.

Adjustment A represents anticipated decreases in sales. Based upon the circumstances hypothetically applicable to the entity under analysis, it was determined that a 15% reduction represents the highest *reasonable* adjustment under the circumstances and 5% the lowest. Considering the most materially relevant facts, 10% was selected as the most probable expected outcome.

Table 2

| Year 5 | Reasonable Outcome Scenarios | | | |
|--|------------------------------|-------------------------|--------------------------|-------------------------|
| | Low | Middle | Upper | Expected |
| Gross sales volume year 5, assuming sales volume of \$6,000,000 year 1 and 5% annual growth | \$7,293,038 | \$7,293,038 | \$7,293,038 | \$7,293,038 |
| Less: Risk adjustment applicable to sales volume (not sales price) | | | | |
| Reasonable variance | | | | |
| A 5, 10, 15% | <u>364,652</u> | <u>729,304</u> | <u>1,093,956</u> | <u>729,304</u> |
| Adjusted gross sales volume | <u>6,928,386</u> | <u>6,563,734</u> | <u>6,199,082</u> | <u>6,563,734</u> |
| Cost of sales (79%) | 5,473,425 | 5,185,350 | 4,897,275 | 5,185,350 |
| Plus: Risk adjustment to cost of sales | | | | |
| Reasonable variance | | | | |
| B 3, 5, 7% | <u>164,203</u> | <u>259,267</u> | <u>342,809</u> | <u>259,267</u> |
| Adjusted cost of sales | <u>5,637,627</u> | <u>5,444,617</u> | <u>5,240,084</u> | <u>5,444,617</u> |
| Gross profit | <u>1,290,758</u> | <u>1,119,117</u> | <u>958,998</u> | <u>1,119,117</u> |
| Fixed costs | 850,000 | 850,000 | 850,000 | 850,000 |
| Plus: Adjustments to fixed costs | | | | |
| C + 150,000 | <u>150,000</u> | <u>150,000</u> | <u>150,000</u> | <u>150,000</u> |
| | <u>1,000,000</u> | <u>1,000,000</u> | <u>1,000,000</u> | <u>1,000,000</u> |
| Pre-tax profit | <u>\$290,758</u> | <u>\$119,117</u> | <u>\$(41,002)</u> | <u>\$119,117</u> |
| Present value @ 6% discount rate, annual convention, five years. | | | | <u>\$89,011</u> |

Adjustment B represents anticipated increases in the price of materials and supplies included in the cost of goods sold category. Adjustment C represents known or reasonably anticipated increases in fixed costs such as rent, insurance, and property taxes.

It is assumed that the 6% amount was determined in accordance with generally accepted procedures and is valid.

Inclusion of the risk adjustments depicted above (one in Table 1 and three in Table 2) cannot safely be ignored in a damages calculation. The use of published risk factor data applied in accordance with the traditional approach does not adequately reflect these adjustments because they are unique to each situation.

CALCULATION

It is assumed that the pre-adjusted figures in Table 2 have been "normalized" (adjusted for material non-recurring, non-economic, or other unusual items to eliminate anom-

alies and facilitate comparisons). If the calculation is to be applied to a majority interest, the normalized figures should be further corrected to eliminate elements of "discretionary income" prior to making adjustments on account of risk factors.

Column 4 of Table 2 serves as the calculation of the year 5 expected net cash flow and present value (without consideration of income taxes).

The data in column 4 might otherwise represent a calculation in its entirety. However, failure to calculate columns 1 through 3 will deny the analyst the certain and important benefits of an explicit consideration of risk factors and their magnitude discussed in the paradigms of analysis, presentation, and support.

The omission of columns 1 through 3 may also compromise conformity with Con 7. Inclusion of columns 1 through 3 conforms to the intent of paragraph 45 of Con 7 in connection with the expected cash flow approach, which reads, in part,

as follows: "...uses all expectations about possible cash flows instead of the single most likely cash flow" and "focusing on direct analysis of the cash flows in question and on more explicit statements of the assumptions used in the measurement."

Note that Table 2 represents only one year of the period to be included in the calculation, that the summation of all years equals the results of the calculation, and the number of years to be considered may itself be subject to a range (at least for calculation purposes).

The table's format may also serve as a practical tool to determine the mean of the distribution of possible cash flows. For all practical purposes the "mean" is represented by column 4. The mean in column 4 is not an arithmetic mean but rather the mean of an implicit asymmetric distribution of the possible outcomes whose probability is represented by column 4. In that regard it is not in conformity with the rigid formal calculation elements of Con 7. Instead,

they represent possible actual circumstances as may be found in the field, which circumstances are best addressed by straightforward assessment of the understood probabilities rather than by a more formal statistical analysis. However, it is well within the framework and intent of Con 7, is easier to use by CPAs as a class, and avoids the problematic task of formally assessing the otherwise required mathematical probability factors of different outcomes.

In addition, columns 1 through 3 are not intended to represent "Best Case, Most Likely, and Worst Case Scenarios" as used in the sequentially tiered averages of the "First Chicago Method." The "Expected" column in Table 2 captures compelling, if not controlling, factual circumstances applicable to the subject company and does so in connection with specific line items of the company's income statements, leading to a more reliable determination of expected cash flow. The Table 2 worksheet may also serve as a convenient format for use in annual re-evaluations required in the performance of attestation services.

PRESENTATION

In providing attestation services, if the auditor chooses to present the expected (most likely) factor total of all years, it may be desirable for the auditor to disclose that the total is the result of factually considered probabilities of outcome.

In providing litigation services, the expert needs to consider the benefits of the use of ranges. Presentation of a range for purposes of economic damage determinations and valuations is generally desirable for several reasons. One reason is that doing so helps to imbue an aura of impartiality and resultant credibility on the part of the expert. On the other hand, determination and presentation of a range may be contraindicated by controlling law in instances such as equitable distribution in divorce and separation matters.

Another benefit of presenting a range is that doing so better provides a jury or a trier of fact a choice, which is in conformity with the valuation or economic damages expert's role as a provider of information for the benefit of the court.

The consideration of ranges is one of the foundations of the expected cash flow approach as defined by Con 7. If one does not consider the ranges and the expected outcome it is hard to say that one is computing or basing the analysis on expected cash flows.

Plaintiffs should consider that use of appropriate and reasonable damage ranges allows for a choice between something and something as opposed to a choice between something and nothing.

While the expert is well advised to consider ranges in the determination of damage amounts, the expert is not irrevocably compelled to provide a range of damages as an opinion. Such consideration also allows the expert witness CPA insights to potential areas of rebuttal and thus enhances the CPA's ability to anticipate and overcome such rebuttal.

SUPPORT

One can think of no better foundation for support of one's opinion than the existence of a more thorough analysis of the relevant facts and circumstances upon which the opinion is based. In that regard, the preceding discussion of the analysis and calculation process associated with the expected cash flow approach as defined in Con 7 serves as an invaluable tool. Such analysis also better enables the CPA to meet the standard of "Sufficient Relevant Data."

The use of the Expected Cash Flow Approach as presented here avoids the numerous limitations and incompatibilities inherent in statistical data, particularly when applied in conjunction with the traditional approach. Such limitations and incompatibilities include, but are not limited to, the following:

- The assumption of a diversified stock portfolio.
- Inclusion of averages from the year 1926 to the most recent year prior to publication of the reference book, which averages may be unsuitable to the period under review.
- Inability to determine easily if a low capitalization rate is due to distress or other factors not applicable to the entity whose expected cash flows are being evaluated.
- Information taken from guideline companies will likely not have been normalized, and are thus incomparable.
- If the subject company cannot reasonably be expected to go public, there is no basis to use publicly traded stock as a measure.

An expert witness must comply with requirements resulting from the *Daubert* decision in order to ensure that the court will not throw out his or her work product and opinion. Two of the *Daubert* criterion are "Whether the technique or theory [used to determine the present value of expected cash flow] has been subjected to peer review and publication" and "The degree to which the technique or theory has been generally accepted in the scientific community." Con 7 has been subjected to peer review and publication and has been generally accepted in the scientific community.

Also, the expert's technique or theory must be able to be "reasonably assessed for reliability" and his or her testimony must be based (per rule 702) "upon reliable underlying facts, data or opinions." Accordingly, the expert should maintain clear explanation and adequate support for adjustments to expected cash flow such as those shown in Table 2. Other applicable professional standards also come into play by way of support, such as sufficient relevant data, due professional care, and professional competence.

Material conformity with the

results obtained through application, in whole or in part, of the Expected Cash Flow Approach as herein described can serve as an acid test of the reasonableness of a present value prepared in accordance with the Traditional Approach. Lack of conformity may be used as a basis for challenge.

As Pratt and others say in *Valuing a Business*, "Economic damages often require or may benefit from the use of business valuation methods. Both disciplines rely heavily on the income approach method. Damages experts need not consider more than one approach or method and need not limit their examination to data that were available prior to the valuation date. Any business valuation analyst who is asked to express an opinion regarding economic damages should be careful to recognize the many differences between these two disciplines." (Emphasis added).

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A Case in Point

In an actual case, the plaintiff alleged it incurred damages based upon lost anticipated profits resulting from its inability to initiate a new business venture because of the defendant's breach of contract and violation of the Fair Trade Act.

Plaintiff's CPA expert used a 20% combined present value discount rate in arriving at economic damages based upon net cash flow.

During his deposition, the expert was caused to agree that the 20% all-inclusive present value discount rate included other risk factors in addition to a 6% risk-free rate of interest. He further conceded that such additional risk factors include, but are not limited to, the following: the existence of well established competition; inexperienced management; untrained sales force; insufficiently comprehensive breadth of product range in inventory due to inadequate working capital; inadequate warehousing and inability to extend traditional credit to customers.

When pressed for his opinion about what a reasonable percentage adjustment should be on an individual income statement line item basis attributable to each of the above stated risk factors, the expert was caused to acknowledge that his 14% all-inclusive, comprehensive risk factor (equal to the 14% factor in Exhibit A by coincidence only) is materially understated. He agreed that as a result of such understatement the calculated net present value of the damage amount represented in his written opinion is likewise materially overstated. When the income statement line item math was presented to him, he also agreed that there was indeed no positive net cash flow and that therefore the plaintiff's damage amount equals zero.

INDUSTRY *Expert*

WHAT MAKES SOFTWARE COMPANIES UNIQUE?

By James S. Rigby, CPA/ABV

Unique issues arise when valuation analysts value a software company. An understanding of these issues is critical to analysts' ability to analyze the value of a company and to help client executives and owners understand the uniqueness of the industry in which they participate. This understanding also helps valuation analysts and their clients to recognize business risks and capitalize on market opportunities.

Every business owner believes his or her company is unique. This is

right—up to a point. Most businesses are not unique in terms of their basic economic operation. Software companies are an exception. Jim Catty, a Canadian financial analyst who specializes in software, started a list of unique characteristics of software companies, which he offered in his presentation entitled "Valuing Software and Internet Companies," at the 1999 High Tech Industries Conference of the California CPA Education Foundation. Our firm, the Financial Valuation Group, has

continued adding to and refining the list over the years.

The software industry's many unique characteristics include:

- *Limited market life.* The market life of a software program is limited. Generally, investors and tax authorities expect software to have a life of two to three years. However, established programs have core technology, which often can be enhanced to prolong their lifespan through several versions. Such programs have greater value because successive versions increase and extend the cash flow generated. In some cases, new versions are almost new products and extend product life significantly.
- *Economic scalability.* Software is the ultimate intellectual property. After it is created, making and selling an infinite number of copies is easy and cheap with few