Rate & Flow

An Overview of an Alternative Approach to Determining Active/Passive Appreciation in Marital Dissolutions

In this summary article, we present an overview of a complex and detailed valuation model. To download your complimentary e-book containing the full text of this discussion, please see www.mercercapital.com.

This model is presented in conjunction with a discounted cash flow analysis. Slight changes in the approach, along with the application of common sense, make this model applicable to the single period capitalization method and the guideline company method (both of which receive a fuller treatment in the foundational article), but we present only the discounted cash flow analysis here. In states where an owner/spouse’s active management of a business does not preclude the consideration of passive appreciation, the following model offers a fresh approach based on rate and flow analysis.

The basic premise: Under certain circumstances, you can calculate active/passive appreciation by starting with the valuation date—which is presumably the date of separation, although in some states it may be the date the divorce action began. Then by “dialing back” the various components of value (discount rate and cash flows) to the date of the marriage, you can isolate the respective contributors to appreciation in value.

This model applies rate-volume analysis to the appreciation of the value of an enterprise to separate “exogenous” and “endogenous” contributors to the change in value. Exogenous events have a direct impact on appreciation, but are beyond the control of the company’s management—such as a decline in the interest rate environment. Endogenous events are those events driven by management that contribute to appreciation. Our model seeks first to identify the former, reaching the latter as the residual or remainder.

The model examines the internal/external factors in a simple, reasonable way. It’s based on a primary rule of finance: that the value of an enterprise is equal to a measure of cash flow (or earnings) times some multiple—the multiple reflecting the different growth expectations of investors as well as their required rates of return for various securities.
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By limiting the focus to a certain time period (here, the date of marriage to date of separation), and then looking at the various changes in the components of value within that time frame—some of which management can influence, others which it cannot—we can gain insights into the “active” appreciation of the enterprise.

As a simplifying example, assume the following:

- The Company has no debt; thus cash flows to equity equal cash flows to the enterprise;
- Cash flows to equity equals net Income (which implies that depreciation equals capital expenditures, without any requirement to invest incremental working capital);
- The Company has one owner/manager, who supervises all other employees (eliminating the effect of multiple owners/managers); and
- No control premium applies to this business, given the discounted cash flow analysis—although it might apply to valuations based on other methods.

**Value on the Date of Marriage**

Using January 1, 1995 as the date of the marriage, and by applying a discounted cash flow analysis to our one-owner corporation, the calculations in Figure 1 reach a starting value for the Company's of $8.2 million.

### THE COMPANY
**VALUATION ANALYSIS AS OF JANUARY 1, 1995**

<table>
<thead>
<tr>
<th>Derivation of Cash Flow</th>
<th>For the Fiscal Years Ended December 31</th>
<th>Terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1,500,000</td>
<td>1,605,000</td>
<td>1,717,350</td>
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<tr>
<td>Discounting Periods</td>
<td>0.50</td>
<td>1.50</td>
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<td>Present Value Factors</td>
<td>0.6227</td>
<td>0.7100</td>
</tr>
<tr>
<td>Present Value of Cash Flows</td>
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<td>1,139,550</td>
</tr>
<tr>
<td>Indicated Value</td>
<td>$8,168,000</td>
<td>(Rounded)</td>
</tr>
</tbody>
</table>

### Derivation of Discount Rate and Capitalization Factor

#### Long-Term Government Bond Yield-to-Maturity (1995) 7.73%

<table>
<thead>
<tr>
<th>derivation</th>
<th>factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ibbotson Common Stock Premium</td>
<td>6.50%</td>
</tr>
<tr>
<td>x Market Beta</td>
<td>1.00</td>
</tr>
<tr>
<td>+ Beta Adjusted Common Stock Premium</td>
<td>0.50%</td>
</tr>
<tr>
<td>+ Small Capitalization Stock Premium</td>
<td>3.50%</td>
</tr>
<tr>
<td>= Total Equity Premium</td>
<td>10.00%</td>
</tr>
<tr>
<td>+ Company Risk Premium</td>
<td>0.00%</td>
</tr>
</tbody>
</table>

- Discount Rate (Required Rate of Return) 25.73%
- Sustainable Growth in Earning Power (at end of projection) -0.00%
- Terminal Capitalization Rate 19.73%

Terminal Capitalization Factor (1/CR) rounded to: 0.10 5.19

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Value on the Date of Separation

Delaying a discussion of specifics for the time being, we then applied the same DCF analysis to the Company’s value on the date of separation—ten years later, and arrived at the result in Figure 2.

As the numbers reveal, over the relevant time period cash flow increased while the discount rate fell (due to the decrease in its various components), and the Company’s value is now, according to our analysis, $31.7 million. (This is a summary; the specific rates and projections we used, plus all calculations, are set out the base article).

Appreciation Analysis

Very simply, to calculate total enterprise appreciation over the ten years, we subtract the first or beginning value from the second or final value, arriving at $23.6 million. We then broke down this figure into its various elements, as seen in Figure 3.

For each step in the process, we altered elements of the 2005 DCF analysis, in some cases replacing various components with their respective amounts in the 1995 model. Let’s walk through an example.

As a first step, we changed the risk-free interest rate from 4.51% to 7.73%, which was the risk-free rate in 1995. This change reduced the overall value to $26.0 million, accounting for $5.2 million of appreciation. The reason: “But for” the change in the risk-free rate, the value of the Company would have been $26.0 million, and the difference ($5.2 million) becomes appreciation that is attributable to the “exogenous” change in rates.

Similarly, the next two changes involved “ratcheting back” the equity market return requirements and the Company’s specific risk premium from the percentages used in the 2005 DCF to those used in the 1995 DCF. Moving backward in time, each of these components increased—which resulted in a decreased enterprise value, and allowed us to isolate more of the difference between $8.2 million and $31.7 million. Like the decrease in risk-free rates, the change in equity premiums is considered passive appreciation, amounting to approximately $1.5 million, while the change in specific risk premiums is considered active appreciation, because it rises directly from management’s efforts, and is approximately $3.3 million.
We specifically chose to address fluctuations in the risk-free rates and equity premiums first, as they are obviously beyond the Company’s control. If these factors had increased from 1995 to 2005, then we omit these steps, since business owners are not charged for replenishing value lost over time.

Additionally, we chose to start with the 2005 discount rate and increase it appropriately (moving backward in time), rather than beginning with the 1995 discount rate and decreasing it (moving forward in time) because the changes in the discount rate that occurred over this time period increase the value of each dollar of earning power that existed in 1995 and each new dollar of earning power that was created during the period in question.

After accounting for these changes in the discount rate, we then made similar adjustments for the changes in cash flow. Essentially, we assumed that an exogenous event had occurred: The government had doubled reimbursement payments for a certain health-care product, with the expectation that the reimbursements would continue at this higher rate. The removal of these cash flows from the 2005 projected cash flows decreased the value from $21.3 million to $16.0 million. The model appropriately characterizes this portion of overall appreciation in enterprise value as exogenous or passive appreciation.
Following Through On the Final Steps
In the next step, we added cash flows to the 1995 DCF analysis, based upon some reasonable growth metric in the Company's industry or market. The specific metric is not as important as the methodology, as the model included numerous types of adjustments. Given the base assumptions, and all other circumstances remaining the same, we concluded that with the growth of the industry, the Company's 2005 earnings could have reasonably grown to $10.1 million. We deemed the resulting $1.9 million portion of appreciation to be passive, due to external market/industry expansion—although there are situations where isolation of this portion might be inappropriate.

After identifying various passive elements (decline in risk-free rates and equity market return requirements, an exogenous cash flow element—plus overall industry growth), and one active element (decline in specific Company risk premium), we are left with a residual $5.9 million appreciation, which must be active. (If it's not passive, then the appreciation must be active.) Remember a basic premise of the model: It's much easier to identify passive or exogenous contributors to appreciation, and then allow the remainder or residual to be active or endogenous, rather than the other way around.

The model also tackles the problem from a different angle than any other method we know, ratcheting back through time rather than forward. Yet the basic calculation of total appreciation starts with the final value: so why not use the same method to account for its active/passive components? Traditional methods still have their place in various scenarios, but in divorce cases, this model provides a simple but solid framework for analyzing active/passive appreciation.
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<td>$95.00</td>
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<td>We are responding to requests to put this book back into print and we are doing so as an e-book</td>
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<td>The first SFAS 142 valuation resource for CFOs and auditors. Also available in printed form at <a href="http://www.mercercapital.com">www.mercercapital.com</a></td>
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* Pinpoint your market
* Target your prospects
* Which tools of the trade work and which do not
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  o Newsletters
  o Speaking engagements
  o Articles
  o Books
  o Giving back to the profession
  o Advertising
  o Sponsorship
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Barbara Walters Price, Moderator

Barbara Walters Price is the Senior Vice President of Marketing for Mercer Capital. Since joining Mercer Capital in 1985, Barbara has been instrumental in developing and implementing the marketing strategy for the firm. She oversees all marketing functions, including product development, the firm’s electronic marketing efforts including supervision of web site design and maintenance, speaking engagements, corporate communications, web and live seminars, book design, publishing, promotion, and business development, among many others.

Barbara is an authority in professional services marketing and regularly provides other professional service firms with marketing and product development advice and information. In addition, she publishes and speaks about professional service marketing topics to other professional service firms and organizations throughout the country.

Nancy Fannon, ASA, CPA/ABV, MCBA, Speaker

Nancy has specialized in business valuation and litigation support work over the course of the last 18 years. She is frequently retained to provide expert witness services relating to the value of a business; an opinion on the amount of financial damages relating to lost profits or the loss of a business or segment of a business; and other financial matters. She is often appointed by a court or mediator as a court-appointed expert, and has served as an arbitrator in valuation cases.

Nancy is a frequent speaker both locally and nationally on the topic of business valuation and damages. She is a regular contributing author for several national valuation journals, has participated in writing valuation textbooks, and has been a technical reviewer on several others.

Harold Martin, MBA, CPA/ABV, ASA, CFE, Speaker

Harold G. Martin, Jr., MBA, CPA, ABV, ASA, CFE, is the Principal-in-Charge of the Business Valuation and Litigation Services Group for Keiter, Stephens, Hurst, Gary & Shreaves, P.C. He has over 25 years of experience in financial consulting, public accounting, and financial services.

He specializes in valuations of closely held companies, litigation consulting and expert witness services, and special financial investigations. He has appeared as an expert witness in federal and state courts, served as a court-appointed neutral business appraiser, and also served as a federal court-appointed accountant for a receivership.

Chris Mercer, ASA, CFA, Speaker

Z. Christopher Mercer is founder and chief executive officer of Mercer Capital. Mercer Capital is a business valuation and investment banking firm serving a national and international clientele.

Mr. Mercer has broad industry experience providing corporate valuation and investment banking services to hundreds of companies in an array of industries. Specific industry experience includes, but is not limited to, auto dealerships, construction, general & specialty contracting, distribution companies, financial institutions, financial services, retail, manufacturing, restaurants, technology companies, telecommunications, trucking & transportation.

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