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Rate & Flow

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

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Rate & Flow: An Alternative Approach to Determining Active/Passive Appreciation in Marital Dissolutions

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Rate & Flow

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

In recent years, various states have introduced the concept of "active" and "passive" appreciation in the distribution of the marital estate during marital dissolution. The basic idea is that marital assets can appreciate in one of two ways. Appreciation (of a piece of separate property) that results from the "active efforts" of one of the spouses is "active" and thus part of the marital estate. Appreciation (again, of a separate piece of property) that does not result from the active efforts of one of the spouses is "passive" and remains separate property.

This concept has appeared, in various forms, in many "equitable distribution" states. After determining that the concept should be included in determination of the settlement, the question then becomes how one can quantify active and passive appreciation. Some methodologies have been proffered, such as the use of regression analysis, or the subtraction of public equity market returns, the risk free return, or inflation. These have their own sets of issues, such as the chicken and egg problem that haunts regression analysis or the issue regarding the interaction of inflation and growth in value.

This article presents Mercer Capital's model for determining "active" and "passive" appreciation 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, but for purposes of brevity, we present only the discounted cash flow analysis here. While this model will not work in every state – the laws are different and require appropriate adjustment – we believe that it is a relevant analysis in those states where the spouse's participation in the active management of the business does not eliminate the possibility that passive appreciation occurred.

Our model applies rate-volume analysis to the appreciation of the value of an enterprise.[1] It is a simple and reasonable way to break out the factors that contribute to enterprise appreciation. The model is based on a primary principle of finance: that the value of the company is equal to a measure of cash flow or earnings times some multiple, and that the multiple is determined by the interaction of investors' required rate of return for different securities and growth expectations. By analyzing the changes that occur during the period in question[2] to these components of value, some of which management can influence, some of which it cannot, we can gain insights into management's "active" participation in the appreciation of the enterprise.

The following sections involve a single example company. The simplifying assumptions are:

- The company has no debt, thus cash flows to equity equal cash flows to the enterprise
- Cash flows to equity equal net income[3]
- There is a single owner/manager of the business; all employees are subordinate to him/her. Thus, any issue concerning the influence of other owners is eliminated
- No control premium is applicable to the company[4]

1 The implementation of the analysis differs somewhat depending on the valuation model employed, and it cannot be applied across the board – such as with the net asset value model.

2 The "period in question" in this particular example is from the date of marriage until the date of separation.

3 Implies that depreciation equals capital expenditures and that there is no incremental working capital investment required.

VALUE ON THE DATE OF MARRIAGE

The relevant time frame is defined by the date of marriage and the date of separation. We assume that the couple in question married in 1995 and separated in 2005. At the date of marriage, the owner-spouse owned 100% of a particular company ("the Company") at the date of marriage and at the date of separation. In the course of the valuation analysis, the appraiser has determined that the discounted cash flow analysis is the most appropriate valuation model (as opposed to the net asset value method, single period capitalization, guideline company method, etc). During the course of the 1995 valuation, projected cash flows to equity are:

	For the Fiscal Years Ended December 31				
Derivation of Cash Flow	**1995**	**1996**	**1997**	**1998**	**1999**
= Cash Flows to Equity	**$1,500,000**	**1,605,000**	**1,717,350**	**1,837,565**	**1,966,194**

Remember that the assumption is that net income equals net cash flow. In the course of the appraisal, the following discount rate and long term growth rate were used:

Derivation of Discount Rate and Capitalization Factor		
Long-Term Government Bond Yield-to-Maturity (1995)		7.73%
Ibbotson Common Stock Premium	6.50%	
x Market Beta	1.00	
= Beta Adjusted Common Stock Premium	6.50%	
+ Small Capitalization Stock Premium	3.50%	
= Total Equity Premium		10.00%
+ Company Risk Premium		8.00%
= Discount Rate *(Required Rate of Return)*		**25.73%**
- Sustainable Growth in Earning Power (at end of projection)		-6.00%
= Terminal Capitalization Rate		19.73%
Terminal Capitalization Factor (1 / CR) rounded to:	0.10	5.10

At Mercer Capital, we use modified Ibbotson premiums, based on a paper written by J. Michael Julius.[5] In the valuation, an 8.0% company risk premium was selected as was a beta of 1.0 and projected a 6.0% terminal growth rate. The terminal capitalization factor is 5.10, resulting in a terminal value of $10.0 million.

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4 Given the scenario presented here, a control premium might be a part of each valuation. Regardless, we have assumed that no control premium is applicable as a result of our use of a discounted cash flow analysis.

5 Mercer Capital conducts an ongoing analysis of the average annual market return data prepared by Ibbotson & Associates, a Chicago financial markets research firm. The Ibbotson data is presented in an annual yearbook, *Stocks, Bonds, Bills & Inflation.* Ibbotson calculates average annual returns based upon data from 1926 to the present. Mercer Capital's analysis indicates that the average returns for multi-year holding periods differ somewhat from the average of annual returns published by Ibbotson. We have estimated multi-year returns to reflect historical premium returns achieved by large capitalization common stocks (the S&P 500) over long-term Treasuries (the common stock premium) and also by smaller capitalization common stocks over the S&P 500 (the small cap premium). For a description of the model, see Julius, J. Michael, "Market Returns in Rolling Multi-Year Holding Periods: An Alternative Interpretation of the Ibbotson Data," *Business Valuation Review*, Vol. 15, No. 2, June, 1996.

Using the mid-year discounting convention, the present value of the cash flows (interim and terminal cash flow) is $8.2 million. The entire worksheet is shown here:

TABLE 1
THE COMPANY
VALUATION ANALYSIS AS OF JANUARY 1, 1995

Derivation of Cash Flow	For the Fiscal Years Ended December 31 1995	1996	1997	1998	1999	Terminal Value
= Cash Flows to Equity	**$1,500,000**	**1,605,000**	**1,717,350**	**1,837,565**	**1,966,194**	**$10,027,589**
Discounting Periods	0.50	1.50	2.50	3.50	4.50	5.00
Present Value Factors	0.8927	0.7100	0.5647	0.4491	0.3572	0.3183
Present Value of Cash Flows	1,339,050	1,139,550	969,788	825,250	702,325	3,191,782

Indicated Value **$8,168,000** (Rounded)

Derivation of Discount Rate and Capitalization Factor		
Long-Term Government Bond Yield-to-Maturity (1995)		7.73%
Ibbotson Common Stock Premium	6.50%	
x Market Beta	1.00	
= Beta Adjusted Common Stock Premium	6.50%	
+ Small Capitalization Stock Premium	3.50%	
= Total Equity Premium		10.00%
+ Company Risk Premium		8.00%
= Discount Rate *(Required Rate of Return)*		**25.73%**
- Sustainable Growth in Earning Power (at end of projection)		-6.00%
= Terminal Capitalization Rate		19.73%
Terminal Capitalization Factor (1 / CR) rounded to:	0.10	5.10

Memo: Derivation of Terminal Value	
Projected Terminal Year Net Income	$1,966,194
x Terminal Capitalization Factor	5.10
= Total Estimated Terminal Value	$10,027,589

VALUE AT THE DATE OF SEPARATION

To now move forward to the date of separation in 2005, the following cash flows to equity are projected:

Derivation of Cash Flow	For the Fiscal Years Ended December 31 2005	2006	2007	2008	2009
= Cash Flows to Equity	**$4,000,000**	**4,280,000**	**4,579,600**	**4,900,172**	**5,243,184**

Again, for purposes of simplifying the example, we make the same bullet-point assumptions as in the 1995 valuation (net income equals net cash flow, etc). The following discount rate and long term growth rate were employed:

Derivation of Discount Rate and Capitalization Factor		
Long-Term Government Bond Yield-to-Maturity (2005)		4.51%
Ibbotson Common Stock Premium	6.00%	
x Market Beta	1.00	
= Beta Adjusted Common Stock Premium	6.00%	
+ Small Capitalization Stock Premium	3.00%	
= Total Equity Premium		9.00%
+ Company Risk Premium		5.00%
= Discount Rate *(Required Rate of Return)*		**18.51%**
- Sustainable Growth in Earning Power (at end of projection)		-5.00%
= Terminal Capitalization Rate		13.51%
Terminal Capitalization Factor (1 / CR) rounded to:	0.10	7.40

In the 2005 valuation, a 5.0% company risk premium was selected as was a beta of 1.0, and projected a 5.0% terminal growth rate. The terminal capitalization factor is 7.40, resulting in a terminal value of $38.8 million. Using the mid-year discounting convention, the present value of the cash flows is $31.7 million. The entire worksheet is shown in here:

TABLE 2
THE COMPANY
VALUATION ANALYSIS AS OF JANUARY 1, 2005

	For the Fiscal Years Ended December 31					Terminal
Derivation of Cash Flow	**2005**	**2006**	**2007**	**2008**	**2009**	**Value**
= Cash Flows to Equity	**$4,000,000**	**4,280,000**	**4,579,600**	**4,900,172**	**5,243,184**	**$38,799,562**
Discounting Periods	0.50	1.50	2.50	3.50	4.50	5.00
Present Value Factors	0.9192	0.7757	0.6545	0.5523	0.4660	0.4278
Present Value of Cash Flows	3,676,800	3,319,996	2,997,348	2,706,365	2,443,324	16,598,453

Indicated Value **$31,742,000** (Rounded)

Derivation of Discount Rate and Capitalization Factor		
Long-Term Government Bond Yield-to-Maturity (2005)		4.51%
Ibbotson Common Stock Premium	6.00%	
x Market Beta	1.00	
= Beta Adjusted Common Stock Premium	6.00%	
+ Small Capitalization Stock Premium	3.00%	
= Total Equity Premium		9.00%
+ Company Risk Premium		5.00%
= Discount Rate *(Required Rate of Return)*		**18.51%**
- Sustainable Growth in Earning Power (at end of projection)		-5.00%
= Terminal Capitalization Rate		13.51%
Terminal Capitalization Factor (1 / CR) rounded to:	0.10	7.40

Memo: Derivation of Terminal Value	
Projected Terminal Year Net Income	$5,243,184
x Terminal Capitalization Factor	7.40
= Total Estimated Terminal Value	$38,799,562

In 1995, the Company was valued at $8.2 million. In 2005, the Company was valued at $31.7 million. Thus, according to our analysis, the enterprise appreciated by $23.6 million during the course of the marriage. This appreciation can be separated into various components by examining the changes that occurred in the various components of value.

RECAP OF THE GORDON GROWTH MODEL

The Gordon Growth Model, a staple of modern corporate finance theory, tells us that the value of a company is the present value of all future dividends discounted at some appropriate rate. The model states that value is, fundamentally, the function of three variables: 1) projected cash flows; 2) a discount rate; and 3) time.

$$Value = \sum_{t=1}^{n} \left(\frac{CF_t}{(1+r)^t} \right)$$

Gordon Growth Model

THE RISK FREE RATE

A discounted cash flow model is simply an extended version of the Gordon model in which cash flows are projected for some period into the future and then capitalized a distant projection of net income into perpetuity. In the case of the two valuations presented above, the model has not changed over time. The 2005 analysis uses the same primary components of value (cash flows, discount rate) that the 1995 analysis uses, but the inputs have changed, and the value of the Company has increased. By adjusting some of these values back to their 1995 values, we can isolate the "appreciation" in the Company's stock. The value in 2005 is the following:

$$Value_{05} = \sum \left(\frac{\text{Projected Cashflows}_{05}}{\left(1 + RFR_{05} + ICSP_{05} + SCP_{05} + CRP_{05}\right)^{t}} \right)$$

RFR_{05}: The risk free rate at January 1, 2005
$ICSP_{05}$: The Ibbotson Common Stock Premium (as measured by Mercer Capital) at January 1, 2005
SCP_{05}: Small Capitalization Stock Premium at January 1, 2005
CRP_{05}: company risk premium at January 1, 2005

To adjust for the change in the risk free rate, the risk free rate is "dialed back" to its value at the 1995 valuation:

$$Value = \sum \left(\frac{\text{Projected Cashflows}_{05}}{\left(1 + RFR_{95} + ICSP_{05} + SCP_{05} + CRP_{05}\right)^{t}} \right)$$

The risk free rate at the time of the 1995 valuation was 7.73%. The risk free rate in 2005 was 4.51%. This represents a drop of 322 basis points over this time period. The idea here is that, if the long term risk free rate had not fallen during this time period, or rather, "but for" the drop in interest rates, the value of the Company would have been lower in 2005 than it actually was.

To account for the drop in interest rates, the risk free rate is increased by 322 basis points to 7.73%. Doing so increases the 2005 discount rate by 322 basis points and reduces the conclusion of value from $31.7 million to $26.0 million. The worksheet is shown here.

TABLE 3
THE COMPANY
VALUATION ANALYSIS AS OF JANUARY 1, 2005

Derivation of Cash Flow	For the Fiscal Years Ended December 31					Terminal
	2005	2006	2007	2008	2009	Value
= Cash Flows to Equity	**$4,000,000**	**4,280,000**	**4,579,600**	**4,900,172**	**5,243,184**	**$31,459,104**
Discounting Periods	0.50	1.50	2.50	3.50	4.50	5.00
Present Value Factors	0.9071	0.7452	0.6121	0.5029	0.4131	0.3741
Present Value of Cash Flows	3,628,400	3,189,456	2,803,173	2,464,296	2,165,959	11,768,851

Indicated Value	**$26,020,000**

Net of change in risk free rate

Derivation of Discount Rate and Capitalization Factor		
Long-Term Government Bond Yield-to-Maturity (01/01//2005)		7.73%
Ibbotson Common Stock Premium	6.00%	
x Market Beta	1.00	
= Beta Adjusted Common Stock Premium	6.00%	
+ Small Capitalization Stock Premium	3.00%	
= Total Equity Premium		9.00%
+ Company Risk Premium (see comment below)		5.00%
= Discount Rate *(Required Rate of Return)*		**21.73%**
- Sustainable Growth in Earning Power (at end of projection)		-5.00%
= Terminal Capitalization Rate		16.73%
Terminal Capitalization Factor (1 / CR) rounded to:	0.10	6.00

Memo: Derivation of Terminal Value	
Projected Terminal Year Net Income	$5,243,184
x Terminal Capitalization Factor	6.00
= Total Estimated Terminal Value	$31,459,104

But for the change in the risk free rate (which affects the cost of capital) the value of the Company would have been $26.0 million.

Given that this is the case, we can attribute $5.7 million of appreciation to the general decline in interest rates.

Breakdown of Appreciation Components	Value	Appreciation	% Total Appreciation
Final Value as of January 1, 2005	$31,742,000		
Value, net of change in Risk Free Rate	$26,020,000		
Interest Rate Change (Rates Declined)		**$5,722,000**	**24.3%**

We account for the change in interest rates first because they are beyond the control of the owner-spouse and affect the value of each dollar brought in by the Company.

EQUITY MARKET RETURN REQUIREMENTS (ICSP, SCP)

Next on the docket: the decline in equity return requirements as calculated by Mercer Capital. As stated earlier, our estimates of market return requirements (the common stock premium and the small capitalization premium) are based on a paper written by Michael Julius in 1995.[6] According to our study, market return premiums for equity securities declined during the relevant time period from 6.50% (common stock premium) and 3.50% (small capitalization premium) to 6.00% and 3.00%. This represents a total decline of 100 basis points in the discount rate. "But for" the decline in market return requirements, the value of the Company would have been lower. To account for this change, the two risk premiums are increased to their 1995 values, such that the value equation is now the following:

$$Value = \sum \left(\frac{\text{Projected Cashflows}_{05}}{\left(1 + RFR_{95} + ICSP_{95} + SCP_{95} + CRP_{05}\right)^{t}} \right)$$

This adjustment causes the present value of the cash flows to decline further to $24.5 million, as shown below. We can subtract the two values to determine the appreciation attributable to the decline in equity risk premiums demanded by the market.

TABLE 4
THE COMPANY
VALUATION ANALYSIS AS OF JANUARY 1, 2005

	For the Fiscal Years Ended December 31					Terminal
Derivation of Cash Flow	**2005**	**2006**	**2007**	**2008**	**2009**	**Value**
= Cash Flows to Equity	**$4,000,000**	**4,280,000**	**4,579,600**	**4,900,172**	**5,243,184**	**$29,361,831**
Discounting Periods	0.50	1.50	2.50	3.50	4.50	5.00
Present Value Factors	0.9034	0.7361	0.5998	0.4887	0.3982	0.3591
Present Value of Cash Flows	3,613,600	3,150,508	2,746,844	2,394,714	2,087,836	10,543,833

Indicated Value $24,537,000

Net of change in risk free rate, equity return requirements

Derivation of Discount Rate and Capitalization Factor		
Long-Term Government Bond Yield-to-Maturity (2/14/2005)		7.73%
Ibbotson Common Stock Premium	6.50%	
x Market Beta	1.00	
= Beta Adjusted Common Stock Premium	6.50%	
+ Small Capitalization Stock Premium	3.50%	
= Total Equity Premium		10.00%
+ Company Risk Premium (see comment below)		5.00%
= Discount Rate *(Required Rate of Return)*		**22.73%**
- Sustainable Growth in Earning Power (at end of projection)		-5.00%
= Terminal Capitalization Rate		17.73%
Terminal Capitalization Factor (1 / CR) rounded to:	0.10	5.60

Memo: Derivation of Terminal Value	
Projected Terminal Year Net Income	$5,243,184
x Terminal Capitalization Factor	5.60
= Total Estimated Terminal Value	$29,361,831

But for the change in equity risk premiums and the change in the risk free rate of return, the value of the Company would have been $24.5 million.

6 *Ibid.*

We subtract the two values and can attribute $1.5 million of the appreciation in a company's value to the decline in market return requirements.

Breakdown of Appreciation Components	Value	Appreciation	% Total Appreciation
Value, net of change in Risk Free Rate	$26,020,000		
Value, net of change in Equity Return Requirements	$24,537,000		
Lower Equity Market Return Requirements		**$1,483,000**	**6.3%**

We made this calculation as the second in the series because market returns are beyond the control of management.

COMPANY RISK PREMIUM (CRP)

The specific company risk premium (CRP) declined between 1995 and 2005. For purposes of this article, we ignore the reason and simply state that it did. The risk premium declined from 8.0% in 1995 to 5.0% in 2005. To adjust for this change, the specific company risk premium is "dialed back" to its 1995 value, such that the valuation equation now looks as follows:

$$Value = \sum \left(\frac{\text{Projected Cashflows}_{05}}{\left(1 + RFR_{95} + ICSP_{95} + SCP_{95} + CRP_{95}\right)^{t}} \right)$$

This calculation is the final change to the discount rate, such that we are discounting the 2005 projected cash flows at the discount rate employed in 1995.

TABLE 5
THE COMPANY
VALUATION ANALYSIS AS OF JANUARY 1, 2005

Derivation of Cash Flow	For the Fiscal Years Ended December 31 2005	2006	2007	2008	2009	Terminal Value
= Cash Flows to Equity	**$4,000,000**	**4,280,000**	**4,579,600**	**4,900,172**	**5,243,184**	**$25,167,283**
Discounting Periods	0.50	1.50	2.50	3.50	4.50	5.00
Present Value Factors	0.8927	0.7100	0.5647	0.4491	0.3572	0.3183
Present Value of Cash Flows	3,570,800	3,038,800	2,586,100	2,200,667	1,872,865	8,010,746

Indicated Value **$21,280,000**

2005 projected cash flows discounted at 1995 discount rate

Derivation of Discount Rate and Capitalization Factor		
Long-Term Government Bond Yield-to-Maturity (2/14/2005)		7.73%
Ibbotson Common Stock Premium	6.50%	
x Market Beta	1.00	
= Beta Adjusted Common Stock Premium	6.50%	
+ Small Capitalization Stock Premium	3.50%	
= Total Equity Premium		10.00%
+ Company Risk Premium (see comment below)		8.00%
= Discount Rate *(Required Rate of Return)*		**25.73%**
- Sustainable Growth in Earning Power (at end of projection)		-5.00%
= Terminal Capitalization Rate		20.73%
Terminal Capitalization Factor (1 / CR) rounded to:	0.10	4.80

Memo: Derivation of Terminal Value	
Projected Terminal Year Net Income	$5,243,184
x Terminal Capitalization Factor	4.80
= Total Estimated Terminal Value	$25,167,283

But for the change in the company risk premium, market return requirements, and the risk free rate, the value of the Company would have been $21.3 million in 2005.

We subtract $21.3 million from the value obtained in the previous calculation and can attribute $3.3 million of the change in enterprise value to a lower specific company risk premium.

Breakdown of Appreciation Components	Value	Appreciation	% Total Appreciation
Value, net of change in Equity Return Requirements	$24,537,000		
Value, net of change in Company Risk Premium	$21,280,000		
Lower Risk to Company Cash Flows (Active)		**$3,257,000**	**13.8%**

CHANGES TO THE CASH FLOWS

We have reverted every component of the discount rate to its 1995 level. Now we deal with changes in the lone tenant of the numerator: the cash flows.

Terminal Value

Some readers will notice that, despite the statement that we have thus far not altered the cash flows in the equation, the cash flow represented as the terminal value has changed in each equation. The terminal value is the present value of all post 2010 net income discounted at the appropriate discount rate. The forecast of all future cash flows involves the selection of a long-term growth rate, such that the equation for the terminal value is:

$$\text{Terminal Value} = \sum\left(\frac{CF_{2011}}{(1+r)}\right)+\left(\frac{CF_{2011}\times(1.06)^{1}}{(1+r)^{2}}\right)+\ldots+\left(\frac{CF_{2011}\times(1.06)^{n-2011}}{(1+r)^{n-2010}}\right)$$

Note that the growth variable, or "g", is the 6% figure used above. The above equation can be reduced to the familiar Gordon Growth Model:

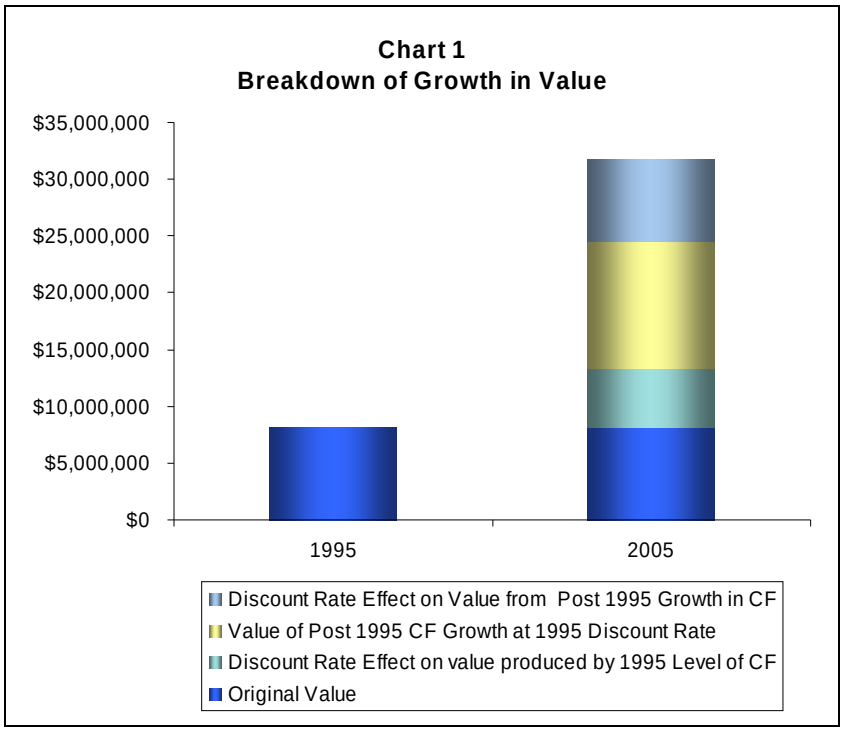
$$\text{Terminal Value} = \frac{CF_{2011}}{r-g} = \frac{CF_{2011}}{r-6\%}$$

In the various steps of our analysis thus far, the item that changes is the discount rate (the "r"). The cash flow that is the terminal value declines as the discount rate rises, because the present value of any set of future cash flows declines as the discount rate increases. Thus, without a change in any post 2010 cash flow, the terminal value/cash flow declines as a result of the increase in the discount rate. So, while technically the cumulative net income changes from step to step, we are not actually altering our annual net cash flow projection for any year beyond 2010.

Why are Cash Flows Second?

Cash flows are dealt with after the changes in the discount rate because a portion of the value produced by each $1 of earning power is different in 2005 than it is in 1995, as a result of the changes in the discount rate. The projected level of cash flow that existed at the date of marriage would be more valuable in 2005 because the risk free rate is lower, the equity premium is lower, and the company risk premium is lower. Plus, each additional dollar of earning power is more valuable in 2005 than it would have been in 1995 as a result of changes in the discount rate. The business owner (in this scenario) may not be responsible for some portion of the increase in the amount of value produced by each additional dollar of earning power (because he may not be responsible for all the changes in the discount rate).

In the same fashion that a business owner might not be responsible for some of the changes in the discount rate, the business owner may not be responsible for some portion of the increase in the earning power of the business. Given this possibility, it is necessary to handle the changes in the discount rate first, as we have done. This allows us to isolate the owner's contribution to the change in the value produced by the earning power that existed at the date of the first valuation, as well as the additional value (relative to that which would have been produced at the date of the first valuation) produced by each new dollar of earning power created since the date of marriage, both of which have resulted from changes in the discount rate, before examining the actual change in the Company's earning power and the relevant portion of that change contributed by the business owner. We examine the change in the multiple before we examine the change in earning power to properly segregate the effects of the owners' contribution to the business. This can be graphically depicted as such:



To simplify this example: in 2005, a client came to the Company and agreed to spend an amount that resulted in the real equivalent of $1 a year of net income forever. The earning power of that $1, which is assumed to grow at an inflation rate of 3.0%, translates, at 2005's discount rate, to added enterprise value of $6.45 ($1 / 18.51% - 3.00%) of value. If that event had occurred in 1995, the added earning power would have translated into added enterprise value (for purposes of simplicity, we assume the inflation rate stayed the same, even though the risk-free rate changed) of $4.39 for the enterprise. Part of the change in the value creation resulted from changes in the risk free rate and equity premiums, while the other part comes from a lower specific company risk rate. Thus, to be able to properly account for the changes in the value created by each new dollar of earning power and the new level of value creation owed to the Company's earning power at the date of the first valuation, we must handle the changes in the discount rate first.

Changing the Cash Flow/Earning Power

Next, we demonstrate the manner in which the cash flows are accounted for. Of course, the primary determinants of adjustments to the cash flows are the reasons why the cash flows changed. This means that the analyst has to understand and be able to justify any changes.

There are many ways in which a company's cash flows can be affected by factors outside the Company. In fact, the cash flows of businesses are affected everyday by external influences. The issue is whether or not the effect can be identified and quantified.

The primary question is whether the change in cash flows resulted from an exogenous event (vs. management direction) and whether the event was due to a single event or changes over time in the marketplace.

One of the determinations made when answering the single event/market trend question is whether or not the adjustment is applied to the cash flows at the date of initial valuation or the date of final valuation. For example, if the population of an area doubled during the course of the analysis, and the business owner had a business with an exclusive distribution agreement for his product or service, it might be reasonable to say that his unit sales level would have doubled without him doing much of anything special. This would dictate increasing the original 1995 unit sales level (and increasing the other line items appropriately) and flowing it through your model, rather than say, trimming various components of the 2005 income statement.

On the flip side, other events are accounted for by adjusting the expected cash flows at the date of the final valuation. For our purposes here, we assume that any increase in the profits of the firm attributable to potential cost savings or other reasons are due exclusively to management efforts and thus are part of the "active" residual that remains after we break out the active and passive components that are, theoretically, easier to isolate.

Once it has been determined that a particular event should be applied to the cash flow projections at the initial or final date of valuation, the proper adjustment must be determined.

A key item to remember is that if the external or internal influence caused cash flows to decrease, we do not have to include it in the analysis. We can ignore these items since replenishment of value does not count against the owner-spouse. This will be discussed in greater detail below.

As stated earlier, cash flows and net income are equal in this example to keep things simple. Naturally, there can be additional issues in the calculation of free cash flow that might cause the analysis to be more complicated.

Depending upon the nature of the business, non-recurring exogenous events may have occurred that provide a set of cash flows (into the future) that may be identifiable. In the case of our example company, the government of Norway determined that reimbursements for the Company's primary product line should be increased by 100%. Through some analysis (irrelevant for purposes of this discussion), we have determined that, but for this exogenous event, the Company's cash flows would have been decreased to the projections shown in the following chart. We discount these lower projections at the 1995 discount rate and take the difference between the two values to determine the appreciation that occurred as a result of this event.

The difference is the result of appreciation caused by the government of Norway paying more money now and the expectation that they will continue to in the future. Each unit that we sell in Norway produces 100% more revenue than it previously did, regardless of our sales success. For purposes of our discussion, we are considering this an exogenous event beyond the control and influence of management.

For purposes of simplicity, we have assumed that the increase in revenue that the Company received from the Norwegian government translates directly to the bottom line of the Company in the form of approximately $1.0 million in cash flow during the current year, growing at the same rate as the rest of net income in years going forward. Again, the oversimplification of this event is for purposes of presenting the model. After subtracting the appropriate cash flows, you discount the cash flows at the 1995 discount rate, providing the value but for the changes in the discount rate and the generous change in government policy. The calculation of the present value of the reduced projected cash flows is shown below.

TABLE 6
THE COMPANY
VALUATION ANALYSIS AS OF JANUARY 1, 2005

	For the Fiscal Years Ended December 31					
Derivation of Cash Flow	**2005**	**2006**	**2007**	**2008**	**2009**	**Terminal Value**
= Cash Flows to Equity	**$3,000,000**	**3,210,000**	**3,434,700**	**3,675,129**	**3,932,388**	**$18,875,463**
Present Value of Cash Flows	*$2,678,100*	*$2,279,100*	*$1,939,575*	*$1,650,500*	*$1,404,649*	*$6,008,060*

Indicated Value $15,960,000

2005 cash flows, net of referenced government contract improvement, discounted at 1995 discount rate

Derivation of Discount Rate and Capitalization Factor	
= Discount Rate *(Required Rate of Return)*	**25.73%**
- Sustainable Growth in Earning Power (at end of projection)	-5.00%
= Terminal Capitalization Rate	20.73%
Terminal Capitalization Factor (1 / CR) :	**4.80**

Memo: Derivation of Terminal Value	
Projected Terminal Year Net Income	**$3,932,388**
x Terminal Capitalization Factor	**4.80**
= Total Estimated Terminal Value	**$18,875,463**

But for this change in the Company's projected cash flows/earning power and the previous changes in the Company's discount rate, the value of the Company would have been $16.0 million in 2005.

Subtracting the difference, we can see that this event increased the value of the firm by $5.3 million.

Breakdown of Appreciation Components	**Value**	**Appreciation**	**% Total Appreciation**
Value, net of change in Company Risk Premium	$21,280,000		
Value, net Government Reimbursement Increase	$15,960,000		
Implied 1995 Value, net of Exogenous Cash Flow Element		**$5,320,000**	**22.6%**

One could also discount the projected difference in cash flows (which in this case would be $1 million starting in 2006, increasing at 7% annually) and you will come up with the same figure. But for purposes of this example, a parallel structure is maintained.

The key, of course, in justifying that a particular event was beyond the control or influence of the Company's management and quantifying its effects on the value of the Company, is actually understanding the business. Determining what adjustments to make to the cash flow projections and actually quantifying their effects is the most time consuming part of this process.

As stated previously, in our example, a public sector customer, the government of a foreign country, has doubled the reimbursement that it pays for one of our products. Our example might sound incredibly convenient, and frankly, it is. Such an event that can be reasonably presented as beyond the control and/or influence of management might sometimes need to seem extremely convenient and/or lucky. However, things like this do occur.

The next piece of the analysis is partly derived from a calculation discussed later. It involves subtracting a value implied by growth in various markets in which the Company does business. The calculation of the second number in this particular part of the model is discussed next. Notice that this calculation is computing the active residual: we have identified changes in the discount rate, which have been characterized as either active or passive, and we have identified changes in the Company's cash flows that resulted from events over which management possessed no control or influence. The remainder of the change, thus, must be the active residual, since everything that is not passive must be active. If you cannot identify the change as passive, then by the process of elimination it must be active. Breaking out "active" events and arguing that the residual is passive makes little sense in this example (though we are not ruling it out under the right circumstances).

Breakdown of Appreciation Components	**Value**	**Appreciation**	**% Total Appreciation**
Value, net Government Reimbursement Increase	$15,960,000		
Value Implied by Growth In Certain Markets	$10,108,000		
Growth of Business, Above Market (Active)		**$5,852,000**	**24.8%**

The final change is applied to the original value of the firm. We estimated that the general market for the Company's products grew by some percentage in the areas in which it possessed exclusive distribution agreements (at the time of marriage). Once again, if these assumptions seem like a perfect storm of circumstances, we use them only for purposes of demonstrating the model.

We assumed that a percentage increase in the market along the way would have increased the quantity of production such that the Company would have been able to grow to $1.9 million in annual earnings, and that a certain level of earnings growth could still be expected in these areas. In this case, rather than removing earnings/revenues/cash flows from the most recent model, we added it to the model built for purposes of the 1995 analysis. The discounted cash flow analysis is presented below:

TABLE 7
THE COMPANY
VALUATION ANALYSIS AS OF JANUARY 1, 2005

	For the Fiscal Years Ended December 31					Terminal
Derivation of Cash Flow	**2005**	**2006**	**2007**	**2008**	**2009**	**Value**
= Cash Flows to Equity	**$1,900,000**	**2,033,000**	**2,175,310**	**2,327,582**	**2,490,512**	**$11,954,460**
Discounting Periods	0.50	1.50	2.50	3.50	4.50	5.00
Present Value Factors	0.8927	0.7100	0.5647	0.4491	0.3572	0.3183
Present Value of Cash Flows	*$1,696,130*	*$1,443,430*	*$1,228,398*	*$1,045,317*	*$889,611*	*$3,805,104*

Indicated Value of Future Sales (rounded) $10,108,000

Derivation of Discount Rate and Capitalization Factor	
= Discount Rate *(Required Rate of Return)*	**25.73%**
- Sustainable Growth in Earning Power (at end of projection)	-5.00%
= Terminal Capitalization Rate	20.73%
Terminal Capitalization Factor (1 / CR) :	**4.80**

Memo: Derivation of Terminal Value	
Projected Terminal Year Net Income	**$2,490,512**
x Terminal Capitalization Factor	**4.80**
= Total Estimated Terminal Value	**$11,954,460**

A simpler way to have done this might have been to assume that the value of the firm would have grown by some percentage as a result of the growth of these markets during the course of the marriage, but the usefulness of such a simplification is dependent upon the nature of the firm in question. Any sort of multiplicative growth, however, should be applied against the appropriate figures (whether total cap, revenue, net income, etc) used in the 1995 valuation. We end by subtracting the value of the firm in 1995 by the value of the firm that could reasonably be inferred by the growth in those markets in which the Company possessed exclusive distribution rights.

Breakdown of Appreciation Components	**Value**	**Appreciation**	**% Total Appreciation**
Value Implied by Growth In Certain Markets	$10,108,000		
Value as of January 1, 1995	$8,168,000		
Growth in Market		**$1,940,000**	**8.2%**

In summary, we calculated that the value of the enterprise appreciated by $23.6 million during the course of the marriage, which we have separated into $9.1 million of active appreciation and $14.5 million of passive appreciation. The entire worksheet is depicted here:

TABLE 8
THE COMPANY
APPRECIATION ANALYSIS
1995 to 2005

	Enterprise Value
Final Value	$31,742,000
Date of Marriage	8,168,000
	$23,574,000

Breakdown of Appreciation Components	Value	Appreciation	% Total Appreciation
Final Value as of January 1, 2005	$31,742,000		
Value, net of change in Risk Free Rate	$26,020,000		
Interest Rate Change (Rates Declined)		**$5,722,000**	**24.3%**
Value, net of change in Risk Free Rate	$26,020,000		
Value, net of change in Equity Return Requirements	$24,537,000		
Lower Equity Market Return Requirements		**$1,483,000**	**6.3%**
Value, net of change in Equity Return Requirements	$24,537,000		
Value, net of change in Company Risk Premium	$21,280,000		
Lower Risk to Company Cash Flows (Active)		**$3,257,000**	**13.8%**
Value, net of change in Company Risk Premium	$21,280,000		
Value, net Government Reimbursement Increase	$15,960,000		
Implied 1995 Value, net of Exogenous Cash Flow Element		**$5,320,000**	**22.6%**
Value, net Government Reimbursement Increase	$15,960,000		
Value Implied by Growth In Certain Markets	$10,108,000		
Growth of Business, Above Market (Active)		**$5,852,000**	**24.8%**
Value Implied by Growth In Certain Markets	$10,108,000		
Value as of January 1, 1995	$8,168,000		
Growth in Market		**$1,940,000**	**8.2%**
Total Appreciation (Enterprise Level)		**$23,574,000**	
Total Active Appreciation (Enterprise Level)		**$9,109,000**	
Total Passive Appreciation (Enterprise Level)		**$14,465,000**	

Overcoming a decline in the value of the business at some point in the marriage is not typically something that the business owner is charged for in divorce. The law has to state a starting point for the analysis, and more often than not, the two points of consideration are the date of marriage and the date of separation. For purposes of explanation, it suffices to say that, if during the period in question, the risk free interest rate had increased rather than declined, then that portion of the calculation would have been removed, and the first part of the analysis would have involved adjusting the equity premiums in the 2005 discount rate.

CONCLUSION

This model presents active and passive appreciation in a slightly different manner than we have seen anywhere else – by looking at the final value as the starting point of the analysis rather than attempting to start from the date of initial valuation. It breaks down the increase in value into its two most basic components: changes in the cash flows/earning power of the business and changes in the multiple (discount rate). ◆

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