

EVALuating Mergers and Acquisitions— How to avoid overpaying

Tejpavan Gandhok,
Anurag Dwivedi
Jatin Lal
T: 91-22 654 1536
F: 91-22 654 1535

Executive Summary

Most acquirers tend to overpay because they overestimate the value they will add to the target and execute poorly in delivering promised benefits

This article discusses how Boards of Directors, CEOs, CFOs and Corporate Strategists can use EVA¹ based valuation and performance management techniques to improve their company's chances of success in M&A and other major investments.

The empirical evidence overwhelmingly concludes that in most merger and acquisition transactions, the value created typically goes to the shareowners of the target companies, i.e. acquirers typically overpay. There are two major reasons for this. First acquirers overestimate the value of the target firm and/or the value of the synergies that they will add. Second the rewards of most acquirers' management teams and their advisers are tied to doing the deal rather than to creating wealth for their shareowners¹.

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¹The empirical evidence and a more thorough discussion of the reasons for these observed findings are presented in our EVALuation Volume 3, Issue 4, April 2001; "M&A Why Most Winners Lose", by Dennis Soter.

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We suggest two key applications of the EVA Framework to help companies improve their chances of success in M&A:

- *Use more rigorous analytical tools to help address the over-valuation problem* by improving the rigor of traditional Discounted Cash Flow (FCF) based analysis; and obtaining greater insight into value creation and risk management. Exhibit 1 summarizes our suggested valuation techniques and their benefits over conventional analyses.
- *Encourage Superior Execution by using an integrated EVA linked Decision Making and Performance Management System*—Link performance targets and incentives to the expected EVA improvements to ensure greater accountability post investment.

Exhibit 1: Summary of Best Practice Valuation Techniques

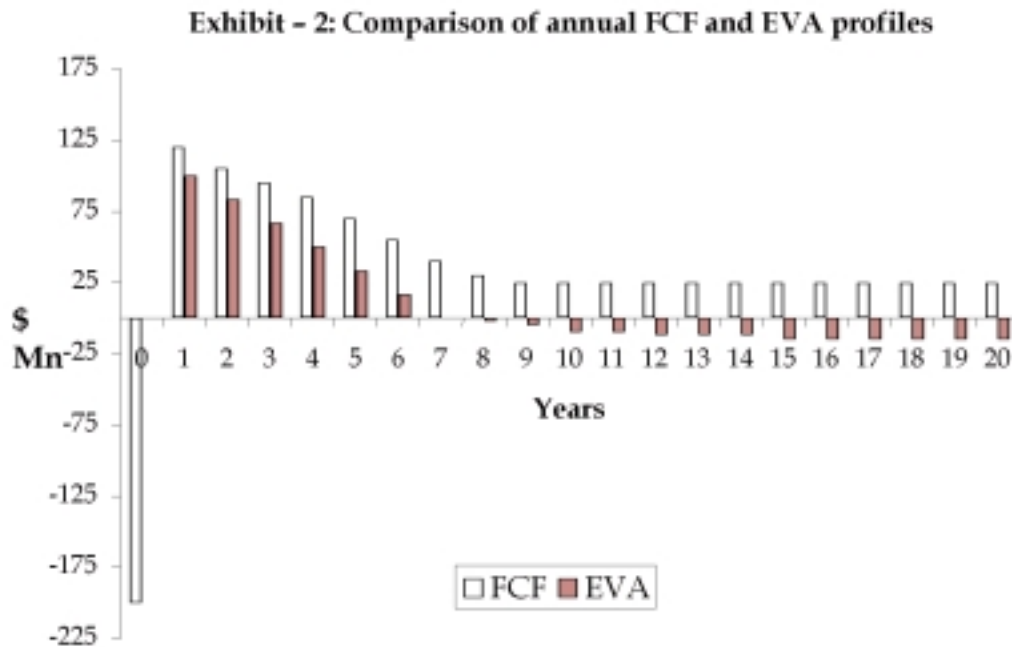
CONVENTIONAL PRACTICE	SUGGESTED BEST PRACTICE TECHNIQUES	BENEFITS
1. Usually look only at absolute value of NPV/IRR over the entire project life	Analyse the cumulative discounted EVA profile to better understand the pattern of value creation over the entire project	Greater insights into sources of value creation and how to manage risk
2. Deal Structure (mix of stock and cash) is mainly used as a tactical negotiating tool and/or as an accounting earnings manipulation device	Better understand the impact of deal structure on pattern of value creation. Understand the sensitivity of the overall valuation to the terminal value assumption.	Enables the acquiring firm to share risks – especially for acquisitions where value creation is further out into the future
3. The Terminal Value (TV) is often a large part of the NPV and is usually based on a “guesstimate” market multiple or cash flow growth rate.	Reality check the implications for key financial value drivers such as growth rate, risk and reinvestment requirement embedded in your TV assumption Address key questions such as: What is the duration over which the business is expected to earn above cost of capital returns? How will the excess returns fade over time?	Insights into the project’s economics, risks. Acquirers can more explicitly link their strategic thinking about the competitive advantage dynamics of the business with its long-term financial implications.
4. Synergies are often estimated only from the perspective of the acquirer.	Understand the Expected EVA Improvement already built into the stand-alone value of the target. Explicitly evaluate the synergies and value of the target to other potential acquirers.	More realistic estimate of synergies. Helps the acquirer avoid double counting the possible improvements and thus avoid overpaying. Improves acquirer’s understanding of its chances of launching a winning bid and reduces the likelihood of getting carried away in a bidding war.
5. Focus is either on a single point estimate of risk for valuing an investment opportunity or analysis paralysis.	Rather than focus only on a single number, think more about the probability of realizing a range of NPVs by conducting more dynamic and probabilistic tools such as Monte Carlo and Real Options analysis.	Greater insight into the sources of value and risk

For the sake of brevity in this article we have not discussed technical details of how to perform advanced valuation analysis such as Probability weighted NPV, Monte Carlo Analysis, Real Options, Adjusted Present Value (APV), etc which are perfectly consistent with both FCF and EVA analyses. The analytical details of these techniques have been discussed in great detail in the finance literature. We apply these techniques to help clients develop better valuation estimates in situations of high risk and uncertainty.



...Use EVA profiles to better understand the pattern of value creation ...

Conventional FCF analysis focuses only on the total NPV/IRR of the project, which helps one understand whether the entire project is value creating or not. In contrast EVA is NPV *by period* and helps one better understand the pattern of value creation throughout the project life. Exhibit 2 illustrates this by comparing the EVA and FCF profiles of an acquisition. Although the total NPV of this investment is positive, this project generates positive EVAs only for the first 7 years, after which the EVAs turn negative even though the project is generating sizeable positive cash flows. Understanding this unusual pattern of value creation raises three very strategic questions for the senior management. “What are the key drivers of value creation in the first seven years?” “What can we do to minimize value destruction during the later years?” “Should we consider exiting this investment in the long-term?”



...Insights into the Pattern of Value Creation can influence your Strategic Choices...

If you better understand the value creation pattern you may end up choosing a different alternative than if you only had information on the total NPV over the entire project life. For example a client in contemplating a new market entry strategy was considering whether to “acquire” a major player at a higher initial investment or “build” a presence with small investments initially and grow subsequently. Conventional FCF analysis gave decision makers information only on the total project NPV/IRR as shown in Exhibit 3 and they were inclined towards the “acquire” alternative as it offered a higher NPV. Even though its lower IRR suggested that it was a riskier alternative than “build”, the IRR was higher than the required hurdle rate of 15%.

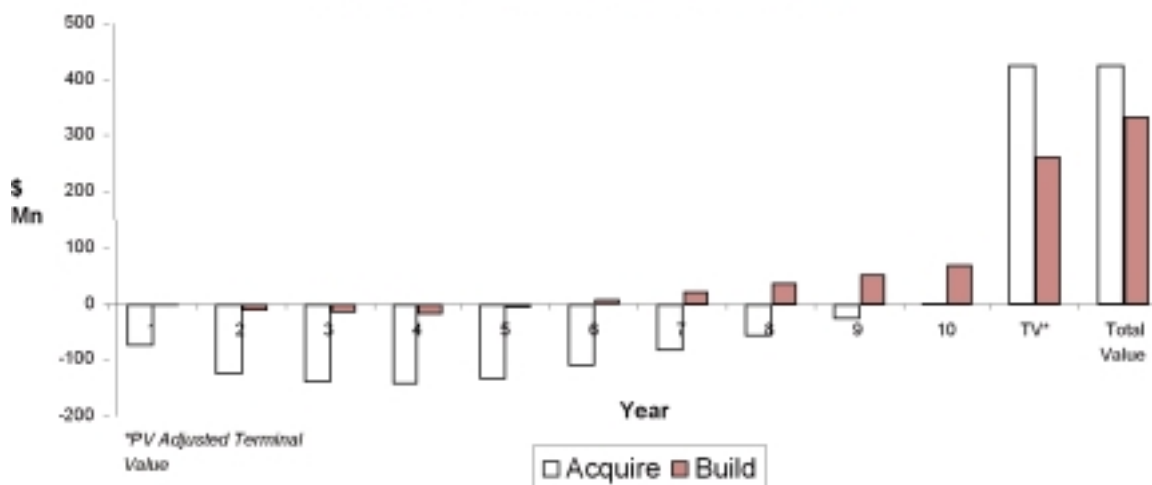
Exhibit 3: NPV & IRR

	NPV, \$Mn	IRR, %
Acquire	426	30%
Build	332	43%



However analyzing the cumulative discounted EVA profile helped them better understand the value creation pattern of the two alternatives. As Exhibit 4 shows, even though the “build” alternative has a lower overall NPV it has a more attractive value creation pattern because it destroys less value in the initial five years, reaches positive NPV faster and creates more value over the forecast ten year horizon. The higher NPV of the “acquire” alternative is all due to the Terminal Value assumption – not an uncommon result with many acquisitions! This insight combined with real options analysis led them to change their mind and opt to “build” note that this choice also preserved the flexibility value of the option to make an acquisition in this segment at a later stage.

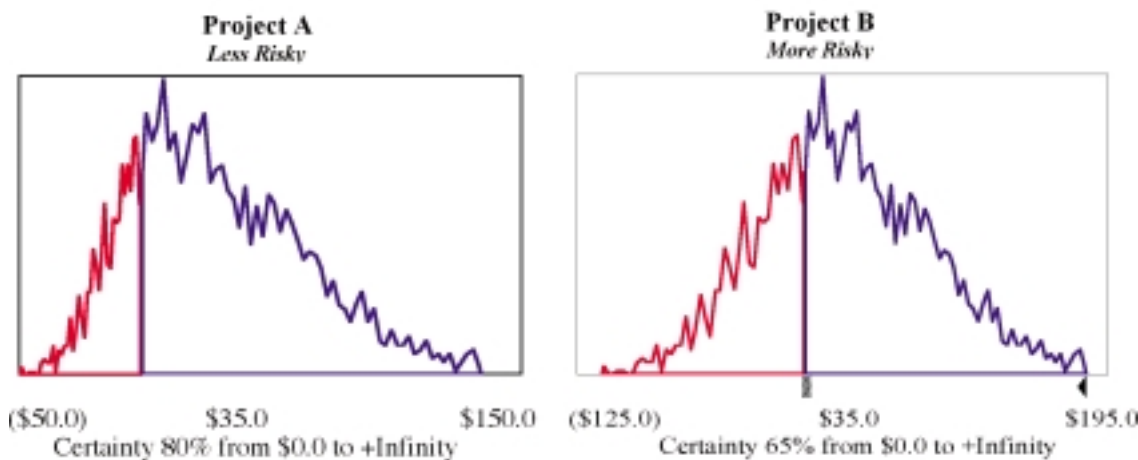
Exhibit - 4 : Cumulative Discounted EVA



...Dynamic tools such as Monte Carlo help understand the sensitivity of NPV to key assumptions / scenarios and better identify sources of risk...

Conventional analysis focuses on an absolute value of NPV based on a single point estimate of risk. Single point analysis fails to take into account the downside risk and upside benefits. When the downside risk / upside benefits are high a single point estimate can be either dangerously optimistic or overly conservative. You should project the sensitivity of project NPV to systematic risks by varying cash flows for various scenarios and changes in key assumptions. Sensitivity analysis will help identify key value drivers, which will call for extra caution in making forecast assumption and will frequently provide more insights on the scenarios / drivers for you to manage. For high-risk large projects, Monte Carlo simulation can help understand the risk profile as well as the expected NPV in great detail. Exhibit 5 shows probability distribution of NPV for two projects. While “expected” NPV of the two projects is the same, project A has a higher probability of positive NPV outcomes compared to project B and is therefore more desirable.

Exhibit 5: Output of Monte Carlo Analysis





EVA BASED CAPITAL BUDGETING

The Present Value of future EVAs is identical to the Net Present Value of future cash flows...

The EVA based valuation approach is totally consistent with accepted corporate finance theory and traditional discounted free cash flow (FCF) analysis. The main difference between EVA and FCF analysis is the treatment of investments. FCF analysis treats a capital investment just like any other cash flow and subtracts the entire cost of the investments in the periods during which they are incurred. EVA spreads the cost of investments over the useful economic life of the assets that have been acquired. The present value of the total depreciation and capital charge levied in EVA analysis is equal to the present value of investments made under FCF. This makes the EVA based approach mathematically consistent with the FCF analysis as shown in **Exhibit A**. Although both EVA and FCF techniques provide the same overall valuation, we suggest companies should do both sets of analysis. The conventional Free Cash Flow analysis should be done to better understand the project's funding requirements and cash generation pattern. EVA based analysis on the other hand can often provide additional insights into the value creation pattern and thus improve the quality of the investment decision.

Exhibit "A" PV(EVA) is identical to NPV(FCF)...

	1	2	3	4	5
Revenue	200	200	200	200	200
Expenses	150	150	150	150	150
Depreciation	20	20	20	20	20
NOPBT	30	30	30	30	30
Taxes	10	10	10	10	10
NOPAT	20	20	20	20	20
Beginning Capital	100	80	60	40	20
WACC	20%	20%	20%	20%	20%
Capital Charge	20	16	12	8	4
EVA	0	4	8	12	16
Discount Factor	0.83	0.69	0.58	0.48	0.40
PV of EVA	0	2.8	4.6	5.8	6.4
PV of EVA					19.6

	0	1	2	3	4	5
NOPAT		20	20	20	20	20
- Net Investment*	100	(20)	(20)	(20)	(20)	(20)
= Free Cash Flow	(100)	40	40	40	40	40
x Discount Factor	1.000	0.83	0.69	0.58	0.48	0.733
= PV of FCF	(100)	33.3	27.8	23.1	19.3	16.1
NPV of FCF						19.6

*Net Investment refers to the period to period change in Capital

...because the PV of Depreciation and Capital Charge is equal to initial investment

	0	1	2	3	4	5
Depreciation		20	20	20	20	20
Capital Charge		20	16	12	8	4
Sum of Depr. & Cap Charge		40	36	32	28	24
Discount Factor		0.83	0.69	0.58	0.48	0.40
PV of Depr. & Cap Charge		33.3	25.0	18.5	13.5	9.7
Sum PV of Depr. & Cap Charge	100					
Initial Investment (FCF)	100					
Difference	0					

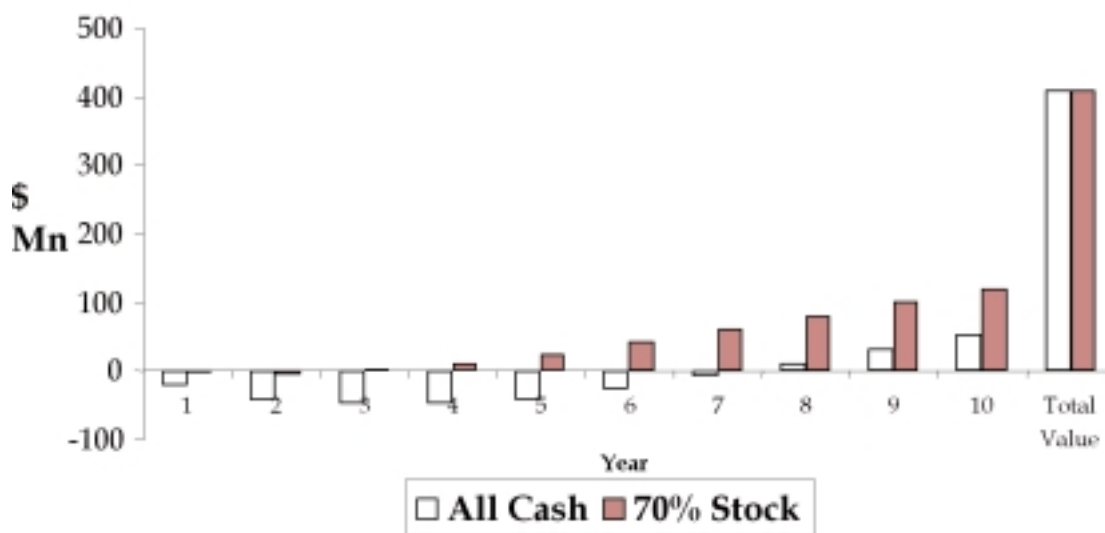


... the acquirer's choice of deal structure can improve the pattern of value creation and help better manage risk...

Where value creation is well out into the future (especially when it is largely driven by the terminal value assumptions) it implies greater risks for acquiring shareowners. One effective way of managing such risks is to share it with the target firm's shareowners by working out alternative deal structures. While it is not uncommon for acquirers to use a mix of cash and stock in acquisitions, the percentage of stock and cash is more commonly used as a tactical negotiating tool and/or as an accounting earnings manipulation device. However, the stock – cash split can also be used as a strategic risk management mechanism. Exhibit 6 compares the cumulative discounted EVA profile to the shareowners of the acquirer when (a) the deal involves paying 100% of the value of the target firm in cash; (b) the deal involves paying 70% of the value in stock and 30% in cash. The total NPV to the shareowners of the acquirer is identical in both cases. Which is what you would expect if the combined firm were fairly valued, because then the discounted cash flow value of the operating profits forfeited is identical to the reduction in the upfront cash payout.

However the value creation pattern can be very different. As Exhibit 6 shows the stock plus cash deal lowers the risks for the acquirer's shareowners, relative to the all cash deal, by bringing forward the NPV breakeven point from 8 years to only 3 years. The reason is that by partly paying for the acquisition through the sharing of stock in the combined firm the acquiring company's shareowners reduce their need to invest greater capital upfront. In return they agree to give away a larger share of the future operating profits of the combined firm. Thus while the total value accruing to the acquiring firms shareowners is the same, the timing of realizing the value and hence the risks can be influenced considerably by the choice of deal structure².

Exhibit - 6 : Cumulative Discounted EVAs to Acquiring Firm's Shareholders



Better Understand the Fundamental Value Creation Implications Of Terminal Value Assumptions

A major problem acquirers face while estimating how much to pay for an acquisition lies in assessing the reasonableness of the terminal value assumption. For acquisitions particularly in high growth sectors the terminal value accounts for a significant proportion of the total value. Yet very often simplistic assumptions are made and the terminal value is calculated either as a simple multiple/ growth rate of the last forecast year's cash flows and/or as a relative valuation multiple (e.g. Value as a multiple of EBITDA, Revenue, Capacity etc) of so-called "comparable" transactions. While these conventional approaches to estimate terminal value appear simple they implicitly have embedded, assumptions about the fundamental drivers of future value creation such as the risk and the rate of future cash flow growth.

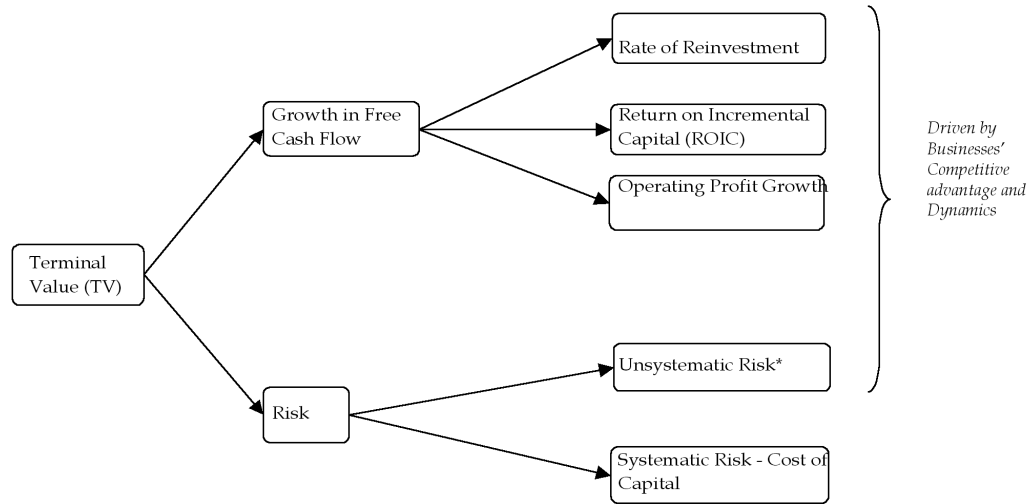
² Of course the final choice of deal structure will also be influenced by other considerations such as tax treatments, preferences of both acquirer and target firms' shareowners, signaling impacts and other complex interactions.



Thinking of terminal value in terms of its value drivers offers greater flexibility and insight into the project. Further disaggregating the FCF growth rate assumption into its constituent drivers: growth in operating after tax profits (NOPAT), rate of reinvestment and the return on incremental investment (ROIC). (see **Exhibit 7**)

The Value Drivers approach allows acquirers to more explicitly link their strategic thinking about the competitive advantage dynamics of the business with its long-term financial implications and address key questions such as: What is the duration over which the business is expected to earn above cost of capital returns? How will the excess returns fade over time?

Exhibit – 7: Drivers of Terminal Value



Therefore acquirers should not only test out the sensitivity of the valuation to different assumptions regarding terminal value, but also reality-check the implications of their terminal value assumption for key financial value drivers. Very small changes can dramatically affect the project economics because the relationship between the multiples and the fundamental value creation assumption are not linear. **Exhibit 8** shows a matrix that contains the ROIC assumptions implicit in using an EBITDA multiple for estimating the value of a firm given different expectations of future NOPAT growth³. For a given growth rate in NOPAT (5%), even a small change in EBITDA multiple (from 3 to 4) would result in a huge change in the required ROIC (from 17% to 88%).

Exhibit – 8: Return on Incremental Capital

Table of Return on Incremental Capital (ROIC) (given EBITDA multiple and perpetual growth rate (g) assumptions)		
EBITDA Multiple	Perpetual NOPAT Growth (g)	
	4%	5%
2	8%	9%
3	17%	17%
4	-156%	88%
5	-14%	-28%
6	-7%	-12%
7	-5%	-8%

Negative ROIC in this case implies that the project would have to keep divesting capital while growing NOPAT in order to achieve the specified EBITDA Multiple.

³This table is calculated using the formula shown below, for a weighted average cost of capital of 18%. This formula assumes that existing capital earns a constant rate of return, a fixed portion of NOPAT will be reinvested in business, the new investment will earn a constant return on incremental capital 'ROIC', and consequently the NOPAT will grow at a constant rate 'g'. TV refers to Terminal Value. Terminal Capital refers to book capital at the end of forecast period. Note this formula does not hold for perpetual growth rates 'g' greater than WACC.

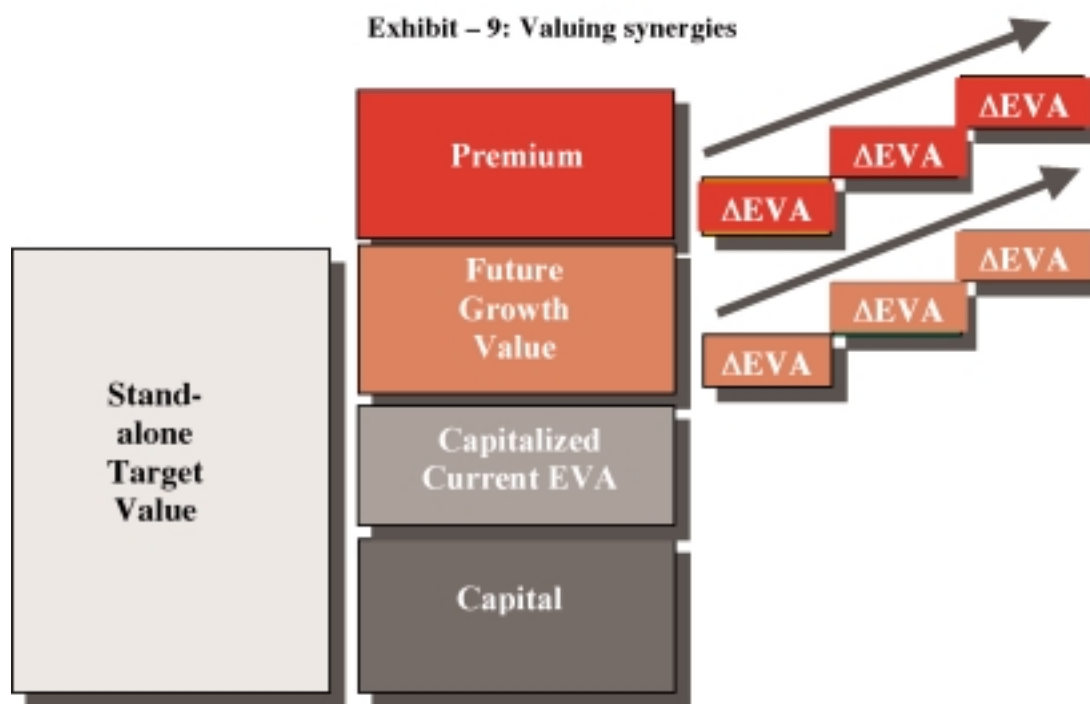
$$\text{Terminal Value} = \frac{[\text{NOPAT} \cdot (1+g) \cdot (1-(g/\text{ROIC}))]}{(\text{WACC} - g)} - \text{Terminal Capital}$$

Understand Expectations of improvement already built into the stand alone value of the target to avoid over-paying...

Acquirers assessing the attractiveness of potential acquisition target often spend considerable effort estimating the value of synergies that would accrue to the combined firm. The synergies define how much more the combined firm is worth in comparison to the standalone value of the two firms put together and thereby help decide the maximum price that the acquirer can afford to pay for the target.

The stand-alone valuation of the target will usually already build in certain expectations of future performance improvement. It is important for the acquirer to understand the extent of the expected performance improvement in the base-line valuation, to more realistically estimate the synergies that they hope to add on top of this to justify the premium for control. By comparing the expected improvements with the perceived synergies the acquirer can determine the maximum premium and avoid double-paying (see Exhibit 9).

The COV[®] - FGV[®] framework helps better understand the future expected improvements in EVA terms by disaggregating the target's stand-alone valuation into its Current Operating Value (the Economic Book Capital plus the Current EVA capitalized as a perpetuity) and the remainder Future Growth Value[‡].



...Understand the real options embedded in the project and how to maximise their value...

The valuation of the project based on the NPV of projected future cash flows does not capture all benefits accruing from the project. Taking up the project might open a set of options that would otherwise not be available to the acquiring firm such as the ability to invest in new projects, enter new markets / geographic areas, adopt new technologies, expand if things work out well, abandon/scale-down the project if things turn out to be unfavorable, etc. These “Real” options embedded in the investment opportunity are analogous to the commonly traded “Financial” options that give the *option holder* a right to buy or sell an underlying asset at a specified price at or before a specified date. Since these options are rights and not an obligation the holder can choose not to exercise this right and allow it to expire. The value of “Real” options can be estimated by adapting the techniques used for valuing “Financial” options[§]. This can be a useful complement to the project's value estimated by NPV/EVA capital budgeting because it helps value flexibility and thus melds strategic intuition with analytical rigor and financial market discipline.

[®]Current Operations Value, COV, Future Growth Value and FGV are registered trademarks of Stern Stewart & Co.

[†]The COV-FGV framework and its applications for Value Based Strategy are discussed in further detail in *EVALuation*, April 2000; “EVA & Strategy”, by Justin Pettit.

[‡]The details analytics involved in arriving at the financial value of real options can be found in “The Promise of Real Options” by Aswath Damodaran, *Journal of Applied Corporate Finance* – Summer 2000, Vol 13 number 2.



However, instead of focusing on estimating the absolute value of the real options we suggest that, it is more important that senior management of the acquiring firm understand what types of real options exist in the investment that they are evaluating. Senior management should think about how they can create these options and maximise their value. This understanding of what options are embedded in the acquisition opportunity and what drives their value not only helps managers better evaluate the go – no go decision on the project, but also enables them to better sequence their actions to maximise flexibility and shareowner value.

Explicitly evaluate the target's value to other potential acquirers

Before deciding on how much to bid for a target, the acquirer should also explicitly assess the value of the target to other potential acquirers. Thinking about other potential acquirers that may be interested in the target and comparing the synergies that are likely to accrue to them relative to you can be very useful. This can improve the acquirer's understanding of its chances of launching a winning bid in a competitive situation and therefore its negotiation tactics. It also helps reduce the likelihood of getting carried away in a bidding war.

Encourage superior execution by using an integrated EVA linked decision making and performance management system to improve managerial alignment and increase accountability

Whatever the merits of the investment decision, most acquirers agree in retrospect that the actual results fail to live up to their expectations. Unforeseen events and under-estimation of “cultural issues” are the most often cited causes. However, most organisations' performance management systems fail to foster and reward the superior execution and sense of urgency needed to achieve post-acquisition integration and deliver the promised synergies. A key reason for this is inadequate accountability - the NPV/ FCF projections made at the time of the investment decision are rarely revisited once the investment has been made and there is a disconnect between the metrics used for investment decision making (usually NPV/ IRR) and subsequent performance measurement (usually accounting earnings relative to budget). Not only does this lack of a closed-loop monitoring system lead to poor post – acquisition implementation, it also indirectly encourages overly optimistic projections at the time of acquisition.

The use of an integrated EVA linked decision making, performance measurement and reward system helps instill greater accountability for delivering targeted shareowner returns by measuring performance and linking the incentives of the management team to the actual post acquisition EVA improvements relative to shareowners' expectations.

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**1345 Avenue of the Americas
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T: 212 261-0600
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**1901 Avenue of the Stars Suite 1245
Los Angeles, CA 90067
T: 310 407-0930
F: 310 407 0937**

LONDON

**10 Baker's Row
Baker's Row, London EC1R 3DD
T: 44-207 713 0088
F: 44-201 713 0099**

PARIS

**10, Place de la Madeleine
75008 Paris
T: 33-01 40 1598 98
F: 33-01 40 1599 66**

MUNICH

**Salvatorplatz 4
D-80333 München
T: 49-89 2420 710
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MILAN

**Ambrosetti Stern Stewart Italia
Galleria Pattari, 2 20122 Milano
T: 39-02 725-6501
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**Level 25 55 Collins St.
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T: 61-3 9650 8100
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T: 65-538-3532
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TOKYO

**3F, Toranomon 45 Mori Building
5-1-5, Toranomon, Minato-Ku
Tokyo, 105-0001
T: 813-3431 3310
F: 813-3431 3380**

SÃO PAULO

**Rua do Rócio, 291 - cj. 91
Vila Olímpia
São Paulo, SP, Brasil 04552-000
T: 55-11 3040 0851
F: 55-11 3040 0853**

JOHANNESBURG

**Suite 316, Third Floor South Tower
Sandton Square
Johannesburg, Sandton 2196
T: 27-11 883 5894
F: 27-11 883 9320**

SHANGHAI

**Unit 3505, 35/F, Bank of China Tower
No. 200 Yin Cheng Zhong Road,
Pudong, Shanghai 200120, PRC
T: 86-21 33 0545 40
F: 86-21 33 05 45 66**

MUMBAI

**Sunteck Centrako #8-03 MMTc House
Bandra-Kurla Complex, Bandra (E)
Mumbai 40051, India
T: 91-22 654 1536
F: 91-22 654 1535**