

Shareholder Value Advisors

Operating Performance and Shareholder Value

Accounting is Important

This essay provides an introduction to Shareholder Value Advisors and our approach to shareholder value analysis. We differ from many proponents of shareholder value. We do not believe that “cash” is the simple solution to performance measurement. We know, from statistical research and practical experience, that current cash flow is a poor measure of market value and company performance (even though future cash flow is the source of all market value). One of O’Byrne’s studies [reported in “EVA and Market Value” in the *Journal of Applied Corporate Finance* (Spring 1996)] shows that cash flow explains 0% of the variation in market/capital ratios among the companies in the Stern Stewart Performance 1000 database for the years 1985-93. Current cash flow is a poor measure of market value and company performance because distressed businesses and successful, but rapidly growing, businesses have negative cash flow. To distinguish between these businesses, we need to convert free cash flow into a meaningful measure of period performance. But we also need to ensure that our measure of period performance remains consistent with discounted cash flow (DCF) valuation. A meaningful measure of period performance requires the accounting concept of investment, i.e., the notion that some cash outlays are not current period expenses because they have a future period benefit. Consistency with DCF valuation requires an economic profit measure that utilizes a capital charge to ensure that the present value of the future expense associated with an investment, i.e., the present value of future depreciation and capital charges, is equal to the initial cash outlay. Consistency with DCF valuation also requires a present value calculation whenever a future cash outlay, e.g., a future pension cost, is recognized as a current period expense.

Capital Charge and Present Value Make Accounting Consistent With DCF Valuation

Capital charge and present value are the two basic techniques that make accounting consistent with DCF valuation. A capital charge allows the recognition of a cash outlay to be deferred to future periods while maintaining consistency with DCF valuation and a present value calculation allows the current recognition of a future cash outlay while maintaining consistency with DCF valuation. Unfortunately, neither of these techniques tells us which particular accounting treatment provides the best measure of company performance. For example, R&D costs could be expensed in the year incurred, amortized on a straight line basis over a finite life, amortized on a sinking fund basis over a finite life, kept on the balance sheet forever at historical cost or even kept on the balance sheet forever and annually accreted to a higher value. All of these accounting treatments are consistent with DCF valuation as long as we use an economic profit measure with a capital charge (see Appendix I). To determine whether a particular accounting treatment provides a better measure of market value and company performance, we need to do empirical research. For R&D, for example, we need to determine, for the industry or an appropriate peer group, whether R&D outlays result in higher future income (before R&D expense) and, if so, how the future income effect decays over time.

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The Importance of Future Growth Value

A meaningful economic profit measure requires significant accounting research, but that research is well worth the effort because economic profit, together with the concept of future growth value, provides the basis for understanding the relationship between the investor's return on market value and the company's return on operating capital and for quantifying investor expectations of future operating performance. The starting point for this analysis is the basic valuation relationships:

Market value of debt =	Present value of future interest and principal payments discounted at the cost of debt
Market value of equity =	Present value of future dividends discounted at the cost of equity
Market value of debt + equity =	Present value of future free cash flow discounted at the weighted average cost of capital
Market value of debt + equity =	Capital + present value of future EP discounted at the weighted average cost of capital

We can split the present value of future EP into two pieces: the perpetuity value of current EP and the present value of expected EP improvement. This distinction gives us the fundamental concepts of current operations value and future growth value:

Market value =	Capital +	Current operations value +
	Capitalized current EP +	
	PV of EP improvement	Future growth value

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A Practical Example – Wal-Mart

Let's look at an example (which we've chosen because it is a famous case of over-valuation and its aftermath):

		Wal-Mart 1992 (\$bil)	Wal-Mart 1994 (\$bil)
Market value =	Market value =	\$81.0	\$61.6
Current Operations Value	Capital + Capitalized current EP	\$16.9	\$26.6
Future Growth Value	PV of Expected EP Improvement	\$55.5	\$25.5
EP		\$957	\$917
Cost of capital		11.1%	9.64%
Stock Price		\$32.00	\$21.25

In 1992, Wal-Mart's future growth value of \$55.5 billion represented almost 70% of its total market value of \$81 billion. Wal-Mart investors, like all investors, were seeking a cost of capital return on the market value of their investment. With a cost of capital of 11.1%, a cost of capital return on \$81 billion of market value is \$9.0 billion. A cost of capital return on market value requires a cost of capital return on current operations value and a cost of capital return on future growth value. A \$9.0 billion cost of capital return on Wal-Mart's 1992 market value represents a \$2.83 billion cost of capital return on its current operations value and a \$6.17 billion cost of capital return on its future growth value.

A cost of capital return on current operations value is easy to express in terms of operating performance: it requires constant EP. If economic profit is constant, we can show (see Appendix II) that there will be enough after-tax profit to provide a cost of capital return on current operations value. If Wal-Mart, in 1993, maintains its economic profit of \$957, its after-tax profit will be \$2.83 billion (the sum of its economic profit and a cost of capital return on its 1993 beginning capital of \$16.9 billion), and provide an 11.1% return on its current operations value at the beginning of 1993. The big problem is: where does the investors' return on future growth value come from? We can show (see Appendix III) that the return on future growth value must come from EP improvement and the change, if any, in the future growth value. There must be enough EP improvement to satisfy:

$$\Delta EP_1 + \Delta EP_1/c + \Delta FGV_1 = c * FGV_0$$

If we assume that ΔFGV will be zero for Wal-Mart in 1993, then we must have $\Delta EP_{93} + \Delta EP_{93}/.111 = \6.17 billion. This requires $\Delta EP_{93} = \$616$ million.

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An Example – Wal-Mart (cont'd)

The critical issue in quantifying investor expectations of future operating performance is the relationship between ΔFGV and ΔEP . This requires an empirical model of the drivers of ΔFGV . If the model shows that $\Delta FGV = a * \Delta EP$, then investor expectations can be expressed simply and robustly in terms of the ΔEP . Suppose, for example, that $\Delta FGV = (1.86/c) * \Delta EP$ (this is the relationship implied by a model of market value levels – not changes - for discount and fashion retailing companies for the period 1985-93). This relationship implies that Wal-Mart's 1993 ΔEP must be large enough for:

$$\Delta EP_{93} + \Delta EP_{93}/.111 + (1.86/.111) * \Delta EP_{93} = 26.8 * \Delta EP_{93} = \$6.17 \text{ billion}$$

This implies $\Delta EP_{93} = \$230$ million.

All DCF valuation models can be characterized in terms of their implicit assumptions about ΔFGV . One common assumption is that competition will eliminate the opportunity to earn superior returns on new capital over a “competitive advantage period”. This implies that future growth value will be zero at the end of the competitive advantage period because the company will have no further opportunities to improve its economic profit. This, in turn, implies that ΔFGV will be negative and hence, that a cost of capital return on future growth value requires sufficient ΔEP to replace the lost future growth value with additional current operations value. For example, if we assume a 20 year competitive advantage period for Wal-Mart and a “sinking fund” amortization of Wal-Mart's \$55.5 billion in future growth value, the expected ΔFGV in 1993 is -\$854 million. This implies that Wal-Mart's 1993 ΔEP must be large enough for:

$$\Delta EP_{93} + \Delta EP_{93}/.111 - \$854 \text{ million} = \$6.17 \text{ billion}$$

This implies $\Delta EP_{93} = \$702$ million. This analysis, like the other two, confirms that Wal-Mart had very substantial expectations of EP improvement at the end of 1992. When Wal-Mart failed to meet investor expectations of economic profit improvement, its future growth value and its stock price plummeted.

Any one of these ΔFGV models – “market goodwill,” ΔEP multiple or competitive advantage period – may be the best model for a particular group of companies. Empirical research is the only way to tell which model provides the most accurate estimates of investor expectations and market reaction to over/under performance for a particular group of companies.

The Proper Measure of Market Performance

The object of accounting research and future growth value models is to provide better models of shareholder value creation. This, in turn, requires a proper measure of shareholder value creation, that is, a measure that is derived from the basic principles of DCF valuation. This section explains why the dollar excess return, not the dollar difference between market value and book capital, is the proper measure of shareholder value creation.

The DCF value of a security is the present value of its future cash flows discounted at an appropriate cost of capital. Suppose, for example, that the prospective buyer of a company anticipates annual dividends of \$25,000, \$50,000 and \$75,000 in years 1-3 of operation and \$100,000 in every year thereafter and has a cost of capital of 10%. The DCF

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The Proper Measure of Market Performance – (cont'd)

value of the company is the present value of the future cash flows, or:

$$\$25,000/(1.1)^1 + \$50,000/(1.1)^2 + \$75,000/(1.1)^3 + \$100,000/(1.1)^4 + \$100,000/(1.1)^5 + \dots$$

When a security, like a common stock, promises an infinite series of cash flow, we can't compute the DCF value without using a formula for the value of an infinite series. In this case, we have a simple infinite series, i.e., a constant dollar amount (\$D) forever, that has a present value of $\$D/c$ when the first payment is one period away. This formula tells us that the value, at the end of year four, of \$100,000 each year beginning at the end of year 5, is equal to $\$100,000/.1$, or \$1,000,000. The DCF value of the company is calculated as follows:

Year	Cash Flow	Discount Factor – Formula	Discount Factor – Value	Cash Flow Present Value
1	\$25,000	$1/(1+c)^1$	.9091	\$22,727
2	\$50,000	$1/(1+c)^2$	.8264	41,322
3	\$75,000	$1/(1+c)^3$	.7513	56,349
4	\$100,000	$1/(1+c)^4$	.6830	68,301
4	\$1,000,000	$1/(1+c)^4$	.6830	683,104
Total				871,713

An important property of DCF valuation is that the annual return on the DCF value is equal to the cost of capital (assuming that the cash flow projections are realized). Thus, it represents the amount we can pay and still earn a cost of capital return on our investment. Let's look at the first year return on the \$871,713 DCF value we've just calculated. The rate of return is equal to the difference between our ending wealth and our beginning wealth, expressed as a percentage of our beginning wealth, or $100 * (\text{ending wealth} - \text{beginning wealth}) / \text{beginning wealth}$. Our ending wealth is the sum of the cash received during the year, \$25,000, and the value of the business at the end of the year. To calculate the value of the business at the end of the year we need to do a new DCF calculation:

Year	Cash Flow	Discount Factor – Formula	Discount Factor – Value	Cash Flow Present Value
1	\$50,000	$1/(1+c)^1$	.9091	\$45,455
2	\$75,000	$1/(1+c)^2$	.8264	61,983
3	\$100,000	$1/(1+c)^3$.7513	75,131
4	\$100,000	$1/(1+c)^4$.6830	68,301
4	\$1,000,000	$1/(1+c)^4$.6830	683,104
Total				933,884

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The Proper Measure of Market Performance – (cont'd)

Our ending wealth is $\$25,000 + \$933,884 = \$958,884$. This represents an increase in wealth of $\$87,171$ which is exactly 10% of the value of the business at the beginning of the year, $\$871,713$.

If we include the purchase price in the DCF calculation, we get the net present value of the acquisition. If we have to pay $\$800,000$ to acquire our example company, the NPV of the acquisition would be $\$71,713$:

Year	Cash Flow	Discount Factor – Formula	Discount Factor – Value	Cash Flow Present Value
0	-\$800,000	$1/(1+c)^0$	1.000	-\$800,000
1	\$25,000	$1/(1+c)^1$	.9091	\$22,727
2	\$50,000	$1/(1+c)^2$	.8264	41,322
3	\$75,000	$1/(1+c)^3$	.7513	56,349
4	\$100,000	$1/(1+c)^4$	.6830	68,301
4	\$1,000,000	$1/(1+c)^4$	.6830	683,104
Total				71,713

The return measure that corresponds to NPV is excess return. The excess return is the future value of the net cash flows treating the initial outlay or beginning market value as a negative cash flow:

Year	Cash Flow	Future Value Factor – Formula	Future Value Factor – Value	Cash Flow Future Value
0	-\$800,000	$(1+c)^4$	1.464	-\$1,171,280
1	\$25,000	$(1+c)^3$	1.331	33,275
2	\$50,000	$(1+c)^2$	1.210	60,500
3	\$75,000	$(1+c)^1$	1.100	82,500
4	\$100,000	$(1+c)^0$	1.000	100,000
4	\$1,000,000	$(1+c)^0$	1.000	1,000,000
Total				104,995

The excess return, $\$104,995$, is equal to the future value of the NPV since $\$104,995 = (1.1)^4 * \$71,713$. More generally, excess return = $(1+c)^N * NPV$ where N is the number of years in the measurement period. The excess return can also be described as the difference between actual and expected wealth at the end of the measurement period:

$$\text{Excess return}_N = \text{actual wealth}_N - \text{expected wealth}_N$$

Actual wealth₄ is the future value of the cash flows for years 1-4, $\$276,275$, plus the ending market value of $\$1,000,000$, a total of $\$1,276,275$. Expected wealth₄ is beginning wealth compounded at the cost of capital for four years, $\$800,000 * (1.1)^4 = \$1,171,280$. The difference, $\$104,995$, is excess return₄.

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The Proper Measure of Market Performance – (cont'd)

A closer look at this case will show why the difference between market value and book capital is not a correct measure of shareholder value creation. Let's assume that we acquire the company at the end of year 0 for its market value, \$871,713. This means that our beginning capital is also \$871,713 and hence, the market-book differential at the end of year 0 is 0. Let's make the assumption that the company distributes its entire after-tax profit each year, so book capital stays at \$871,713 for all future years. The following table shows the company's market value and the market-book differential for the years 0-4:

Year	Capital	Market Value	MV Minus Capital
0	\$871,713	\$871,713	\$0
1	871,713	933,884	62,171
2	871,713	977,273	105,560
3	871,713	1,000,000	128,287
4	871,713	1,000,000	128,287

The market value for each year is the present value of the future cash flows for all subsequent years. Our calculations of the market values for years 0 and 1 are shown above; the calculations for the remaining years follow exactly the same methodology.

In this case, our purchase price, \$871,713, is also the market value of the acquisition, so the NPV of the acquisition, as well as the excess return for all future years, is zero. The market-book differential, however, rises to \$128,287 by year three. The positive differential in this example demonstrates that the market-book differential does not correctly measure shareholder value creation. It is important, however, to understand why the differential does not correctly measure shareholder value creation. The real problem is not the concept of a market/book differential, but the fact that book capital is not adjusted for opportunity cost. The following table shows the calculation of economic profit using the standard definition of book capital:

Year	Beginning Capital	NOPAT	Capital Charge	Economic Profit
1	\$871,713	\$25,000	\$87,171	-\$62,171
2	871,713	50,000	87,171	-37,171
3	871,713	75,000	87,171	-12,171
4	871,713	100,000	87,171	12,829

The problem with the market-book differential is that book capital is adjusted for actual earnings and distributions, so it doesn't recognize any difference between earning and distributing \$25,000 and earning and distributing \$250,000. The company in the latter case has made its shareholders much wealthier, and has a higher excess return, but its market-book differential may be the same as the other company's. We can correct the problem with market-book differential by treating all negative economic profit as a contribution to capital and all positive economic profit as a distribution of capital. The following table illustrates the calculations:

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The Proper Measure of Market Performance – (cont'd)

Year	Beginning Adjusted Capital	NOPAT	Capital Charge	Economic Profit
1	\$871,713	\$25,000	\$87,171	-\$62,171
2	933,884	50,000	93,388	-43,388
3	977,273	75,000	97,727	-22,727
4	1,000,000	100,000	100,000	0

With the adjusted capital calculation, market-book differential is equal to the excess return (\$0) in every year.

Appendix I – A capital charge makes total asset cost the same for all depreciation schedules

The difference between FCF and EP is that FCF charges the full cost of an investment against NOPAT in the year in which the investment is made, while EP spreads the same present value cost over the life of the investment. EP has a much closer relationship to current market value because it does a better job of matching the cost of an investment to the fruits of that investment.

The cost of an investment under EP is depreciation plus the capital charge. The capital charge ensures that the present value of the EP investment cost is exactly equal to the FCF investment cost. Take, for example, a machine with a four year useful life and a purchase price of \$100,000. If we use straight line depreciation and have a 10% cost of capital, the present value of the future depreciation charges is \$79,247, which is \$20,753 less than the \$100,000 cost charged against FCF. However, as the following table shows, the present value of the capital charge over the life of the machine is exactly equal to \$20,753:

Year	Depre- ciation	PV Of Depre- Ciation	Begin- ning Capital	Capital Charge	PV Of Capital Charge
1	25,000	22,727	100,000	10,000	9,091
2	25,000	20,661	75,000	7,500	6,198
3	25,000	18,783	50,000	5,000	3,757
4	25,000	17,075	25,000	2,500	1,708
Total		79,247			20,753

Hence, we have:

Purchase price (\$100,000) = PV of depreciation (\$79,247) + PV of capital charge (\$20,753)

If this same machine had a seven year life, the present value of the future depreciation charges would decline to \$69,549, but the present value of the future capital charges would increase to \$30,451 keeping the total cost of the machine, on a present value basis, exactly equal to \$100,000:

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Appendix I – A capital charge makes total asset cost the same for all depreciation schedules

Year	Depre- ciation	PV Of Depre- Ciation	Begin- ning Capital	Capital Charge	PV Of Capital Charge
1	14,286	12,987	100,000	10,000	9,091
2	14,286	11,806	85,714	8,571	7,084
3	14,286	10,733	71,429	7,143	5,367
4	14,286	9,757	57,143	5,714	3,903
5	14,286	8,870	42,857	4,286	2,661
6	14,286	8,064	28,571	2,857	1,613
7	14,286	7,331	14,286	1,429	733
Total		69,549			30,451

Again we have:

Purchase price (\$100,000) = PV of depreciation (\$69,549) + PV of capital charge (\$30,451)

The present value of the future asset charges remains constant even when the balance sheet asset is appreciating, which implies negative depreciation or a credit to NOPAT. The following example shows the future asset charges for a \$100,000 asset that appreciates \$25,000 a year in the first four years:

Year	Depre- ciation	PV Of Depre- Ciation	Begin- ning Capital	Capital Charge	PV Of Capital Charge
1	-25,000	-22,727	100,000	10,000	9,091
2	-25,000	-20,661	125,000	12,500	10,331
3	-25,000	-18,783	150,000	15,000	11,270
4	-25,000	-17,075	175,000	17,500	11,953
5+	0	0	200,000	20,000	136,603
Total		-79,247			179,247

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Appendix II – Constant EP provides a cost of capital return on current operations value

$$EP_1 = NOPAT_1 - c * \text{capital}_0, \text{ so } NOPAT_1 = EP_1 + c * \text{capital}_0$$

$$\text{If } EP_1 = EP_0, \text{ NOPAT}_1 = EP_0 + c * \text{capital}_0$$

But $EP_0 + c * \text{capital}_0 = c * (EP_0/c + \text{capital}_0) = c * \text{current operations at the end of year 0}$.

Thus, NOPAT, with constant EP, provides a cost of capital return on current operations, but leaves nothing left over to provide a return on future growth value.

Appendix III - Why expected improvement must satisfy $c * FGV_0 = \Delta EP_1 + \Delta EP_1/c + \Delta FGV_1$

A cost of capital return on market value requires $MV_1 + FCF_1 - MV_0 = c * MV_0$

From:

$$MV_0 = \text{Cap}_0 + EP_0/c + FGV_0$$

$$MV_1 = \text{Cap}_1 + EP_1/c + FGV_1$$

$$FCF_1 = NOPAT_1 - \Delta \text{Cap}_1 = EP_1 + c * \text{Cap}_0 - \Delta \text{Cap}_1$$

We can show that:

$$MV_1 + FCF_1 - MV_0 = c * MV_0$$

Implies

$$\text{Cap}_1 + EP_1/c + FGV_1 + EP_1 + c * \text{Cap}_0 - \Delta \text{Cap}_1 - [\text{Cap}_0 + EP_0/c + FGV_0] = c * [\text{Cap}_0 + EP_0/c + FGV_0]$$

Hence,

$$\text{Cap}_1 + EP_1/c + FGV_1 + EP_1 - \Delta \text{Cap}_1 - \text{Cap}_0 - EP_0/c - FGV_0 = EP_0 + c * FGV_0$$

Hence,

$$EP_1/c + FGV_1 + EP_1 - EP_0/c - FGV_0 = EP_0 + c * FGV_0$$

Which leaves:

$$c * FGV_0 = \Delta EP_1 + \Delta EP_1/c + \Delta FGV_1$$

And implies that:

$$\text{Excess return} = \Delta EP_1 + \Delta EP_1/c + \Delta FGV_1 - c * FGV_0$$