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What Determines TSR

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Financial economists, Wall Street professionals, and others have wrestled for decades with the question of what determines total shareholder returns (TSR). TSR itself is mute on the subject. All it reveals are the components of dividend yield and the percentage change in share price, but not the cause. Empirical studies have been decidedly mixed. Some have come down in favor of increasing dividends or growing EPS, while others favor return on capital or profitability measures as the paramount determinants of the returns.

Faced with this vacuum, many corporate teams these days, in what amounts to the worst kind of data-mining exercises, are firing up computers to run regressions to find the variables that best explain the TSR for the candidate company and its peer set over the past 10 to 15 years. But the sample sizes are ridiculously small, and the findings thus completely lacking in statistical credibility. Such studies are putting the cart before the horse.

A derivation from first principles—one that can later be confirmed by empirical research—is needed. As it so happens, there is a way to demonstrate that TSR stems from basic blocking and tackling financial fundamentals. Given that TSR is the sum of dividend yield and share price appreciation, which is true by definition, I will show that TSR is ultimately a function of earning economic profit (or "EVA" as I call it, which is short for "economic value added") and increasing what I refer to as the corporate "aggregate NPV." I further show that if stock prices are determined by discounting expected cash flows, or the equivalent, then the corporate NPV will always equal the discounted value of EVA, and increasing NPV will come down to increasing EVA. The bottom line in my derivation is that cash flow and capital gains are just the messengers that transmit a return that is in fact generated by earning economic profit and increasing economic profit to increase the corporate NPV.

This in turn means that corporate managers who increase dividends or buy back more stock in an attempt to boost their shareholder returns are like farmers squeezing udders harder and harder, expecting more milk without actually providing any fodder to produce it. Paying dividends or buying back stock simply changes the form of the return, but cannot change the overall return unless it somehow changes the EVA profit the firm will earn or is perceived to be able to earn. Simply paying out more cash and manipulating EPS to boost TSR is a fool's errand.

For those unfamiliar with it, EVA is a measure of quality earnings after deducting a priority return for the owners, including the shareholders. Put another way, it measures profit net of a full weighted-average cost-of-capital charge that is applied to the firm's net business assets. It rewards management for lean operations and rapid asset turns that free up expensive capital. And unlike ROI, it gives credit for all growth and all investments that return above the cost of capital, even if the returns are not as high as what the company is currently earning. In short, it gets the incentive right at the margin, and makes each decision stand or fall on its own merits and against a relevant, market-set standard of excellence.

EVA also tracks value more closely by removing the effects of numerous accounting distortions. One example: instead of expensing outlays for innovation (R&D) and brand-building advertising, the spending is written off over time with interest charged at the cost-of-capital rate on the unamortized balance. That way, profit measured according to EVA better matches the cost against the intended benefits. It also discourages managers from myopically cutting the spending just to make a budget goal, and it motivates them to increase investments in innovation and market presence if they think such investments will generate a decent return over the cost of capital, especially if managers' bonuses are tied to increasing EVA, as they should be. Another example is that charges incurred to restructure a business and streamline costs are added back to earnings and added to balance sheet capital, subject to the capital charge. That way, managers want to fail fast—no charge stands in their way of exiting a losing proposition—and to fail well—that is, to make sure any new money invested in a restructuring covers the cost of the capital, just like any other investment. Other adjustments—such as for leased assets, excess cash, deferred taxes, and the like—make EVA an even better, more complete, and more fully comparable measure of real economic profit with a surer connection with market value.

EVA drives TSR because it has a wholly predictable—and, as I will show, *mathematical*—link with creating value. The link is net present value. As finance theory holds, the intrinsic value of every company is the net present value, or NPV, of the future cash flows it will generate, net of investment spending. As my former partner Joel Stern put it, it is "what's left over that counts." That is by now well-known and broadly accepted. What is not so well known, but crucial, is that for any given set of assumptions about future operations, the present value of forecasted EVA always is *exactly the same* as the net present value of forecasted cash flows. That is because EVA automatically sets aside the return that must be earned in each period to recover the value of the capital that has been or will be invested. As a result, EVA always discounts to the value *added* to the invested capital, which is the same thing as its *net* present value. And it is only by *increasing* the firm's net present value that the shareholders are rewarded with an outstanding TSR.

Pause on this point a moment. The equivalence of EVA and cash flow can be proven mathematically but the logic is easy to grasp. Imagine that you are a banker, and you've lent out $1,000. You say to your borrower, "You have two choices: pay me back the $1,000 right now, or, pay it back over, say, 10 years. Pay me $100 a year for a decade. As long as you pay a market rate of interest on the outstanding balance, it's all the same to me; the present value is the same."

What's the analogy? Cash flow deducts the cash when spent. The loan is repaid right away. EVA, by contrast, stretches out capital investments over time, and recoups inventory investments when deducted through cost of goods sold, and plant investments when recouped through depreciation. And by putting a cost of capital charge on the as yet unrecovered capital, the EVA calculation effectively ensures that the present value is always the same as if the capital outlays had been deducted right away. The present value of EVA is the same, for instance, whether R&D is expensed as accountants do, or if it is written off over time with interest, as I have suggested. In sum, the present value of EVA equals NPV, by definition. Which means you don't have to believe in EVA to believe in EVA. You need only subscribe to the view that market values are set by discounted cash flow, and you will find that EVA is simply a better way to measure and maximize DCF value. And as I will show in the pages that follow, EVA is also better than cash flow per se for the purpose of understanding the underlying factors driving shareholder returns.

I have developed a measure of NPV at the corporate level that will be an ingredient in measuring corporate TSRs. I call it "MVA," which stands for "market value added." MVA is the spread between a firm's market value, given its current share price, and the book capital invested in the business (as adjusted for the adjustments that enter into EVA, such as for capitalized R&D and ad spending, and restructuring charges, as was mentioned). For example, if a firm has a total value of $1 billion and has invested $600 million in capital, its MVA is $400 million, the difference. The MVA spread is a very significant measure in its own right, more significant than TSR in many ways. Indeed, the main premise and finding of our paper is that TSR is simply a byproduct of maximizing MVA, which ought to be every company's most important financial goal anyway.

The reason is that MVA measures the wealth a company has created for its owners since the start of the company. It does so by comparing the total cash that the investors have put or left in the business with the present value of the cash that they can expect to take out of it. Said another way, MVA measures franchise value, the value of the business beyond the commodity resources put into it and that hails from all its distinctive assets and proprietary capabilities. And, lastly, as has been said, MVA is the same thing as the corporate aggregate NPV. It is literally a summing up in the market's mind of the net present value of all investments, those the company already has made plus the present value of those deemed likely to materialize down the road. When a firm's MVA increases, it is triply significant. It shows, first of all, that the owners' wealth has expanded; second, that the firm's NPV and franchise value has increased as a result of some improvement in its operational excellence and enlargement of its strategic opportunities; and, third, that the firm's TSR has increased, too. And what does all that boil down to? Increasing EVA. *Increasing* EVA is the key to *creating* wealth, *maximizing* NPV, and *generating* TSR, all at the same time!

A Simple Case

Before delving into the mathematical gore, let's take an example of how this works. Consider a business that is just breaking even on EVA, and that is forecast to continue just covering its cost of capital and generating no EVA forever. This is typical of many mature industries where companies are unable, for long anyway, to differentiate their offering with better value or lower cost. A firm like this may actually continue in business indefinitely and expand sales and grow accounting profits forever, and even at an impressive clip. But if it is only just covering its full cost of capital, it will always be worth just the book value of its invested capital. No value will ever be added to the owners' investment in the business. The firm's NPV and MVA will stay stuck at zero, indefinitely. It is the epitome of breaking even, in an economic sense.

But what about TSR? Will that be zero, too? Not at all. Although no value is created, no return is lost. The TSR that is earned in this example always just matches the cost of capital. The TSR just meets the market's required return for risk, and it comes right from the return that the company is actually earning on the investments in its business.

The prior case sets the stage for the obvious conclusion. The only way that a company can enlarge its owners' wealth—that is, reward them with a premium value on their investments and provide them with a TSR that is above the basic market-expected rate—is to do better than break even on EVA. It must find a way to produce positive EVA profits by making investments that generate returns above the cost of capital and that outperform what investors could otherwise expect to earn on their own. And the more EVA profit the firm produces, and the faster and longer the EVA grows, and the longer it endures, the greater will be the wealth creation, the NPV, and the TSR—all at the same time.

The implications of this are enormous. Because managing for the highest possible EVA is the same thing as managing for the highest NPV and MVA at the corporate level, maximizing EVA has to produce, *as a strictly mathematical matter*, the highest TSR over time. TSR is at bottom a function not of creating value, but of creating more value than the capital that has been invested. It is always a function of producing and increasing NPV and MVA, which is always a function of earning and increasing EVA.

Showing the Math

I've produced a full report that lays out the algebraic derivation in easy-to-follow steps, but let me summarize it here.[1] And instead of starting with TSR, I'd like to begin with another, in many ways more important, return measure called TIR, or total investor return. TIR is the overall return that an investor would earn if he or she owned the entire capital structure, the bonds and stock of the company, whose returns are a direct function of the operating performance of the business. Once I've explained TIR in more detail, I will then show that TSR is just a leveraged version of TIR.

Step 1. TIR comes from earning EVA and increasing MVA

Let's start with a tautology. The total return a business earns on behalf of all its investors comes from two sources, by definition. The first source is the Free Cash Flow it generates, net of all investment spending, which is denoted by the symbol FCF. That's all cash operating receipts minus cash operating disbursements over a period. If a company generates more cash than it is investing, its FCF is positive and will be available to pay out to the owners in the form of interest payments, debt retirements, dividends, or share buybacks. Or, if retained in the business and invested in marketable securities, FCF can be used to make distributions of equivalent present value in later years. If FCF is negative, which means the company is investing more in growth than is available from internal sources, then capital must be raised in that amount from the lenders and shareholders combined (or drawn down from excess cash). Any dividends paid cannot really be paid, only refinanced. But either way it goes, plus or minus, FCF represents the net amount of cash passing to or coming from the providers of capital to the company in that year.

The second return component is the change in the market value of the business during the period, denoted by ΔV. Being able to cash out at a higher end-of-period market value than the initial value is of course also part of the return the capital owners would realize (or the loss they would suffer if the value went down). The rate of return is computed by dividing the total cash flow and capital gain return by the firm's market value at the beginning of the period, denoted by Vo.[2]

Expressed as an equation,

$$TIR = (FCF + \Delta V)/ Vo$$

The formula seems to suggest that pruning investments in order to pump up distributable cash flow will boost the return; that is, a higher FCF looks like it translates into a higher TIR. But is that the whole story? No. What about the possibility that the company's failure to invest more capital reduces its growth and, as a result, its market value? The two effects will offset to a greater or lesser degree, leaving the TIR outcome ambiguous, posed in this way. There are hidden connections between these two elements that enter into the formula that effectively make the formula useless for managing a business. TSR (or TIR) may be a way to keep score, but it provides no help in seeing how to improve the score.

Help is on the way. With a few substitutions, a firm's TIR can be traced right to its EVA. As we saw earlier, a company's Free Cash Flow is the difference between what it earns and what it invests. More formally, it is the NOPAT, or net operating profit after taxes, the firm earns on its income statement, less the period change in the net capital employed on its balance sheet. Expressed in symbols, FCF = NOPAT – ΔCapital.

EVA, too, can be defined from the same elements—to wit, EVA = NOPAT – Capital Charge (which one computes by applying the cost of capital to the invested capital base). Rearrange the terms, and we get the following: NOPAT = Capital Charge + EVA.

The next step is to plug in for FCF and NOPAT in the TIR formula, as follows:

$$TIR = (FCF + \Delta V)/V_0$$
$$TIR = (NOPAT - \Delta Capital + \Delta V)/V_0$$
$$TIR = (Capital\ Charge + EVA - \Delta Capital + \Delta V)/V_0$$

One more sleight of hand is needed. It is to recognize that a firm's MVA, its market value premium to its invested capital, can be represented by V – Capital, which means that the *change* in MVA can be written as the offsetting changes in the two components: ΔMVA = ΔV – ΔCapital. Substituting in, TIR reduces to:

$$TIR = (Capital\ Charge + EVA + \Delta MVA)/V_0$$

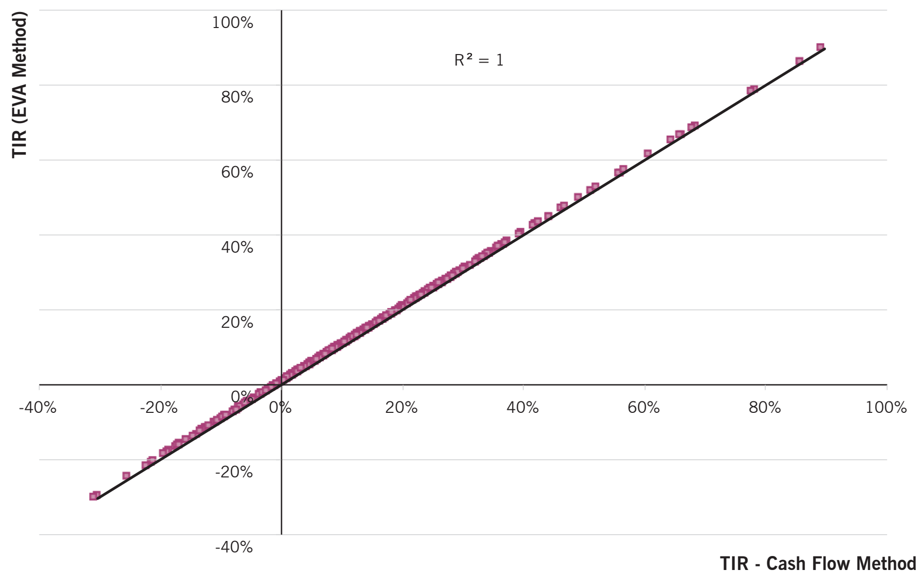
This revised formula shows that the total return a firm generates for all its investors is actually a strict mathematical function of three factors that all come from the EVA model.

The first is the capital charge, expressed as a yield on the firm's beginning value. Though not obvious when the return formula is framed as cash flow plus capital gain, a cost-of-

1. The full report is available at www.evaDimensions.com/EVA2TSR/report

2. In practice it gets a little more complicated when we consider excess cash holdings that are excluded from the definition of FCF but that can also be paid our or accumulated in a period, or if a company spins off a major line of business, and so on. But those are details that do not alter the insights.

Figure 1 **TIR is *Exactly* the Same Both Ways**



capital rate of return is built right into the return for every stock, in every period, by definition. Why? How? Stock prices and market values in general are set by discounting expected future flows. As time passes, and discounting is reversed, compound interest materializes out of thin air and produces the very return used to discount the value in the first place. This is why it is always essential to judge returns against an appropriate benchmark return, for its risk class. And this is also why even stocks that earn no EVA can produce a satisfactory market return (so long as they cover their capital charge), for the base return is always already built in, as I previously indicated.

The second factor comes from earning EVA, from producing a true economic profit above the cost of capital. More EVA directly translates into a higher return, one for one, when denominated by the firm's opening market value—and this, again, is true by definition, as a purely mathematical matter that flows from the definition of TIR.

The third factor comes from increasing MVA. This is key. It takes an *increase* in the *net* present value of the business, not an increase in its overall market value per se, to make a positive contribution to shareholder return. The firm's market value must increase by *more than* any newly invested capital to score points in the TSR game, which is why it is essential that management aim to increase the economic profit earned above and beyond the opportunity cost of that incremental capital.

The question put earlier can now be far more easily answered. Will it be better to cut investments and enhance cash flow, or to make more investments that will increase value? Neither solution is intrinsically right or wrong. It depends. The answer is, so long as the new investment (or new product line or new plant scale) generates profits that cover the cost of capital and add to EVA, that investment will end up increasing EVA, NPV, and total shareholder return. If the question is how to increase TSR, the answer lies in how to increase EVA. Period.

Up to this point, we have derived two equivalent expressions for TIR, one based on cash yield and capital gain, and the other flowing from EVA. The two formulas are applied below for Dow Chemical, covering its 2010 year. The answers are the same both ways, but the EVA formula is more informative. It shows the components that make up the 15% return, which are as follows: 5.1% from reversing the cost of capital charge; 1.0% from the EVA earned in the period; 9.4% from the increase in the firm's NPV over the period, net of a 0.4% adjustment to reconcile EVA with cash flow. [3]

Cash Flow Formula

$\text{TIR} = (\text{FCF} + \Delta V)/V_0$

15.0% = ($4374.3 +$4840.9) / $61,242.3

EVA Formula

$\text{TIR} = (\text{Capital Charge} + \text{EVA} + \Delta\text{MVA} + \text{FCF Adjustment} =)/V_0$

15.0%= ($3122.8 + $614.9 + $5734.6 + -$257.2)/$61,242.3

15.0%= (5.1% + 1.0% 9.4%+ -0.4%)

3. The EVA formula for TIR also includes a term, called FCF Adjustment, which is needed to reconcile the reported financials that are used to compute EVA with the firm's actual cash flows. One example is a retained earnings charge taken to retroactively conform to a new accounting pronouncement. In that case, the simple period-to-period change in the company's book capital understates the firm's actual capital spending. To correct for this, the non-cash charge to retained earnings is folded back into the change in book capital to estimate the company's capital expenditures for the period, and it is thereby correctly deducted from the company's Free Cash Flow. To ensure that EVA and cash flow equate, non-cash charges to retained earnings like that must also be deducted from the EVA return. This is not a conceptual deficiency with EVA but just a grubby reality of the accounting data used in this analysis (which comes from Compustat, a service of Standard & Poors').

We computed TIR both ways for the S&P 500 companies for their 2012 fiscal years and plotted the results in Figure 1. The R-squared is 100%! The formulas are indeed identical. The math works.

Step 2. TSR is Just a Leveraged Version of TIR

The shareholders own the business after paying off the creditors. Their returns, therefore, are simply the returns earned in the business and then magnified, for better or worse, by the ratio of debt-to-equity. This is best seen with the help of the concept of "excess return," which is defined as the *monetary* gain or loss from investing in a specific company or capital class as compared to investing in a benchmark portfolio of matched risk. A company's excess return comes from the performance of its business. It is the TIR earned in the business, less the weighted average cost of capital (COC) appropriate to the business as the relevant benchmark, multiplied by the firm's opening market value. Expressed as an equation,

$ Excess Total Return = (TIR – COC) x Market Value

To take an example, if TIR was 15% and the cost of capital 10%, and the spread was earned on a $100 million initial market value, then the owners would have realized a total of $5 million in profit above what they could expect to earn from a passive investment in a matched-risk portfolio.

The total excess return a business generates necessarily accrues to the investors in the firm as a group. It must be divvied up among the firm's bankers, bondholders, other creditors, preferred stockholders, and common stockholders. To make the apportionment simple, let's divide the investors into just two classes: the common equity shareholders on one side, and all fixed claim holders on the other. This division means that a company's excess return can be represented as follows:

$ Excess Total Return	=	$ Excess Common Equity Return	+	$ Excess Creditor Return

As a practical matter, most or all of the excess return generated in the business falls into the shareholders' laps. A company's fixed income creditors are generally paid the return they contracted for, and with first priority, so excess returns for the creditor class are hard to come by (the exception being the extreme cases where a firm goes into bankruptcy and creditors suffer losses alongside the shareholders). In all cases save the exception, then, changes in the value of the business are passed largely intact to the shareholders. And this means that a simplification can be used, and the expression above can be rewritten as below:

$ Excess Total Return	= $ Excess Common Equity Return
(TIR – COC) x Market Value	= (TSR – COE) x Equity Value

Now let's look at the formula for the excess common equity return. It is computed in a manner similar to the excess total return except that it is based on the firm's TSR compared to its cost of equity (COE) as the relevant benchmark, and then multiplied by the common equity value at the beginning of the period rather than the firm's entire value. The cost of equity is computed in the standard way—namely, by adding a company-specific "beta" risk premium on top of the prevailing long government bond rate. The excess common equity return is the overall gain or loss that the holders of a company's common shares realize compared to what they could have expected to earn by investing the initial equity value in a stock portfolio of the same risk class.

Equating the two formulas and solving for TSR leads to:

TSR =	TIR	+ (COE – COC)	+ (TIR – COC) x Debt/Equity
TSR =	Business Return	+ Equity Risk Premium	+ Leveraged Performance Premium

In words, the shareholders' return always starts off with the TIR earned in the business, plus a risk premium to compensate the shareholders for being paid last and taking greater risk than is contained in the capital structure as a whole, plus a leveraged performance premium—that is, the TIR versus COC spread, which is the degree to which the business is generating above or below the expected return, magnified by the firm's debt/equity ratio.

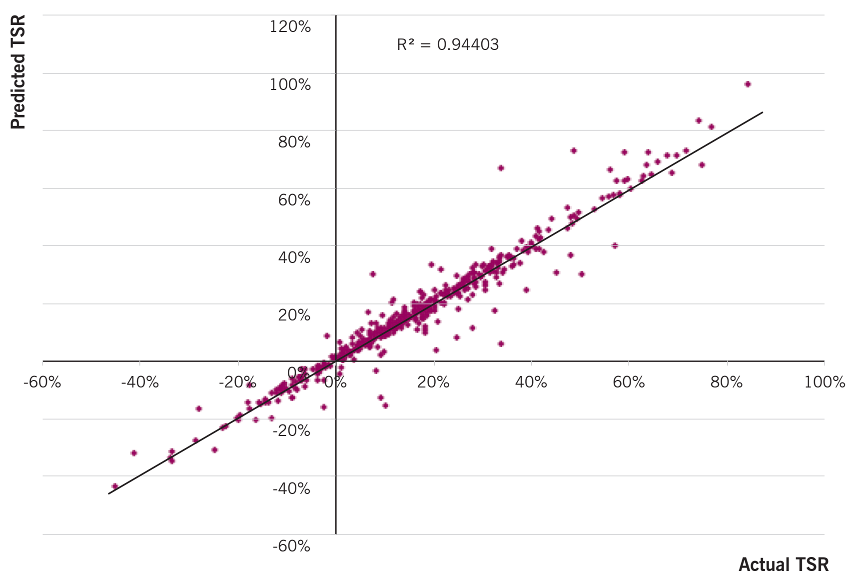
Consider a few cases. Suppose the firm is financed entirely with equity, which means that its debt/equity ratio is zero. In that special case, COC and COE will be the same because the only cost to weight is the cost of equity. For the all equity-financed firm, then, TSR will always equal TIR. The shareholders will simply earn what the business reaps. Their return will flow directly from the EVA and the change in NPV generated by operations. A company like Coca-Cola, which is very conservatively debt-financed as compared to the market value of its equity, looks like this, in effect.

Suppose in the next case that TIR equals COC—that is, the business yields the expected cost of capital rate of return. Then according to the formula, TSR will equal COE. It makes sense that when the business performs just as expected, and generates a COC rate of return, the shareholders can expect to be rewarded with just the return they expect, too. Their return, note, is not COC, the weighted average cost of capital. The leverage provides the shareholders with a higher return, a COE return, to compensate them for bearing the additional financial risk of the firm's leverage structure.

In case three, the firm is leveraged and the business return diverges from the expected return. Now all three elements come into play. Specifically, if the business does well, and TIR > COC, leverage magnifies the performance premium into an even higher TSR—and vice versa.

The leverage that matters is not the book leverage ratio

Figure 2 **The Predicted TSR Matches Actual TSR Quite Closely**



over which CFOs have some degree of control. The leverage that counts in the TSR formula is based on a company's *market* debt/equity ratio. And because this kind of leverage reflects fluctuations in the value of a company's equity, and is not subject to management's control, it can be a source of distortion in judging the TSRs that companies report. For example, suppose a company generates a poor TIR in its business that ends up erasing a lot of its equity value. Going into the next period, its market-value leverage ratio will be "springloaded" in the sense that even a relatively modest TIR recovery will appear as a far more pronounced TSR resurgence than the facts truly warrant.

Let's take a look again at Dow Chemical for an example.

The TSR formula is computed below for 2010 and below it, for 2004:

TSR = TIR + (COE – COC) + (TIR – COC) x Debt/Equity

2010 25.9% = 15.0% + 2.0% + (15.0% – 5.6%) x (93%) [8.8%]

2004 23.2% = 17.2% + 1.6% + (17.2% – 6.7%) x (34%) [3.6%]

Despite earning a 2.2% higher TIR in 2004 than in 2010, Dow's TSR appeared to be much higher, over 2.5% higher, in 2010. In the interim Dow's debt/equity ratio had increased, both because of debt taken on to acquire Rohm & Haas and because relatively meager business returns had erased a considerable chunk of its equity value. The increase in its leverage also reduced its weighted average cost of capital compared to its cost of equity, which added to the built-in risk premium in 2010. Coupled with generally lower interest rates, the higher debt leverage put the weighted average cost of capital more than a full percent lower in 2010 compared to 2004, which helped to widen the spread against its TIR that year. The truth is, Dow's business had a far better year in 2004, but for all the reasons outlined above, the firm's TSR looked a lot better in 2010.

My recommendation, then, is to always separate TSR into the components, and then ask: how much is due to the magnifying impact of leverage, and how much is coming from the underlying TIR earned in the business? This isolates the return that the line teams can control with their operating and strategic decisions, and is just another manifestation of the rule to keep operating and financing decisions distinct.

Once again, we put the TSR formula to a market test covering the S&P 500 companies over the 2012 year. To test, or rather confirm, our derivation, we computed TSR in two very different ways on the chart above. The one plotted left to right is the classic definition, with TSR measured directly from the dividend yield and share price change over the year. The north-south axis plots the TSR predicted by the formula we derived that says that TSR is a leveraged version of the TIR earned in the business—which in turn was computed from recovering the cost of capital, from the EVA generated over the year, and from the change in MVA over the year. As expected, the two answers, covering the S&P 500 companies for 2012, are indeed *nearly identical*![4]

4. The R-squared is not perfect because a whole year is averaged as distinct points, leverage fluctuates, shares are issued or retired at varying prices that differ from end of period prices, prior-claim liability values do change, and certain "non-operating" items excluded from EVA, like the returns from excess cash, do enter into TSR. These effects are real but apparently negligible in the grand scheme of returns, as the evidence shows.

Step 3. EVA is the Real Key to Creating Wealth and Driving Shareholder Returns

The next step in the study was to examine what determines changes in MVA—in the corporate aggregate NPV, if you will—which is the third and most elusive component in the TIR-formula. All other elements have by now been mathematically derived and confirmed, and are computable using standard finance statements and finance theory (as for the cost of capital). Past studies that have attempted to establish a link between EVA and TSR were largely unsuccessful, but not because of the failings of EVA. Rather, researchers in the past have not taken this derivation route. They have failed to derive the correct relationship between EVA and TSR and have failed to eliminate the knowns from the unknowns in their regression analyses. Our deviation is an important step to showing that to explain TSR, once the math is put aside, really boils down to explaining the change in MVA over time. Everything else is known and confirmed and falls out of the EVA formula, leaving this as the essential question: What measure best explains the creation of owner wealth and the market's revisions of corporate aggregate NPV?

Admittedly, the change in MVA is a market measure that is subject to the vagaries of investor perceptions and market conditions. Our model, though, does cast light on how to answer the question. It says that a company's MVA, at any given time, is the market's consensus projection of the discounted stream of EVA profit the firm is apt to earn in the future. Even if investors are actually projecting and valuing cash flow, it will still be true that MVA is governed by the expected present value of EVA. For as I have noted, cash flow and EVA discount to the exact same net present value as a purely mathematical matter. For this reason, the *change* in MVA over a period of time should be highly correlated with the *change* in EVA over that same time.

The correlation will not be perfect, though, because the MVA at the end of a period, which determines the change in MVA over the prior period, will be based on the *forecast* for EVA extending beyond that period. In other words, MVA is influenced by changes in the firm's business prospects extending well into future periods; and past trends in EVA, or any other financial measure, can never fully predict that.

The correlation between changes in EVA and changes in MVA should increase as the observation period is extended. A longer track record will smooth cycles and remove noise from the data. EVA should thus be a better MVA predictor over a five-year interval than it is year to year, for instance—and it is. The correlation also will vary by business and depend on how much the change in profit performance over a prior period can be confidently extrapolated into future periods. One would expect, for example—and indeed one finds—that changes in EVA are a relatively weak predictor of the change in MVA for oil and gas drillers, for real estate firms, and for start-up biotech firms; in other words, for companies that have considerable value in the ground, on the ground, or in a developmental pipeline in which profits materialize with a considerable lag. That is not just a problem for EVA, but for any financial measure. On the other side, EVA also should be a relatively better predictor of MVA—and it is—for consumer staples and products where brands and a technology lead or platform, once established, can create an enduring value.

Now to the test. We began by computing the size-adjusted change in MVA. Specifically, we calculated a statistic called "MVA Momentum," which is the change in MVA divided by the sales in the base period. In effect, it is the rate at which a firm expanded its franchise value relative to the original size of its franchise. It is a wealth creation statistic that permits comparisons across companies that vary in size.

To capture a sufficiently long horizon, MVA Momentum was computed over a five-year interval. A company's 2012 MVA Momentum was computed by taking its MVA at the end of 2012, given its stock price, shares outstanding, and capital base at that time, and then subtracting the MVA it recorded five years before, at the end of 2007, based on its stock price, shares outstanding, and capital base at that time—and then dividing that five-year change in MVA by its sales for 2007. Again, it measures the rate of growth in owner wealth and franchise value, scaled to the sales size of the company. This is the variable we want to explain. The sample covered was once again the S&P 500.[5]

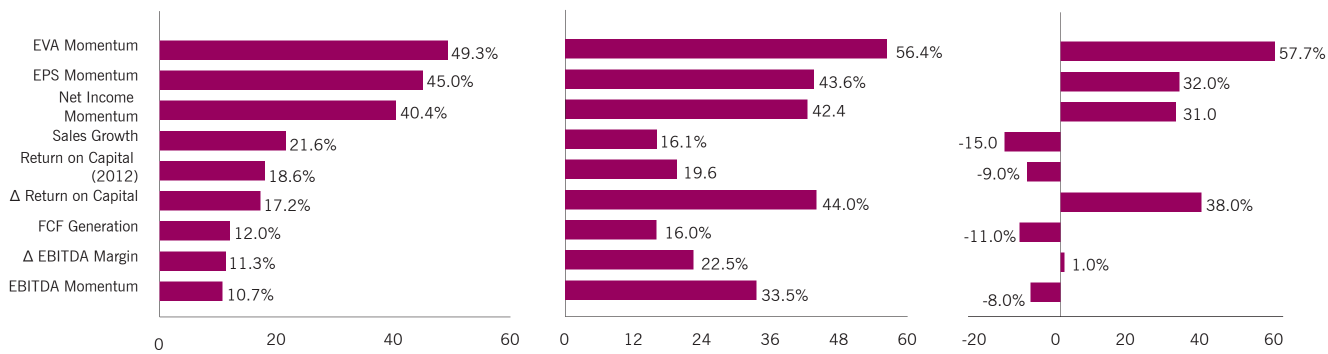
The first and most promising candidate to explain MVA Momentum is EVA Momentum, which is calculated in the same way. It is the point-to-point *change* in EVA over the five-year interval, divided by the sales in the 2007 base period. It measures the rate of growth in economic profit, scaled by the sales of the company. EVA Momentum measures the growth rate in quality earnings, not total earnings, and thus it should best explain the growth in MVA, or MVA Momentum. The other candidates examined were:

• *Net Income Momentum* (measured the same way, as the change in reported net income before unusual items, divided by base period sales);

• *EPS Momentum* (the change in basic EPS, excluding unusual items, times the number of shares outstanding at the end of the base period, divided by base period sales. It measures the growth rate in the net income attributable to an investor who held all the shares outstanding as of five years ago while suffering dilution from new share offerings and without partici-

5. Starting with the S&P 500, we removed 18 firms that lacked a full five years of data (such as Mead Johnson and Kraft Food Group that were spun out of larger companies), and 22 firms that had undertaken large spinoffs (such as Tyco), leaving 460 firms. Then, we removed a set of long lead time firms, which covered all 14 real estate firms, the one biotech firm in the S&P500 with revenues under $5 billion, and 11 small and mid-tier oil and gas firms with revenues under $10 billion, leaving a total of 435 firms in the study. The data set was further pruned through Winsorization to eliminate outliers (firms with variable observations that were outside a plus and minus three standard deviation band around the average) in order to focus on the more normal observations. Lastly, in each regression we removed "misfits," the twenty firms that had the largest divergence between the percentile rank of MVA Momentum and the rank of the variable being regressed. Refer to Appendix 4 for more details.

Figure 3 **EVA is *Really* the Key to Creating Wealth**



R-Squared in Regression with MVA Momentum (2007 – 2012)

R-Squared in *Percentile* Regression with MVA Momentum (2007 – 2012)

R-Squared in *Percentile* Regression through *Origin* with MVA Momentum (2007 – 2012)

Metric	Raw Regression	Percentile Regression	Percentile through Origin	Slope
EVA Momentum	49.3%	56.4%	57.7%	1.00
EPS Momentum	45.0%	43.6%	32.0%	0.97
Net Income Momentum	40.4%	42.4%	31.0%	0.95
Sales Growth	21.6%	16.1%	-15.0%	0.89
Return on Capital	18.6%	19.6%	-9.0%	0.89
Δ Return on Capital	17.2%	44.0%	38.0%	0.89
FCF Generation	12.0%	16.0%	-11.0%	0.85
Δ EBITDA Margin	11.3%	22.5%	1.0%	0.86
EBITDA Momentum	10.7%	33.5%	-8.0%	0.85

pating in share buybacks over the subsequent five-year interval; unlike growth in EPS, EPS Momentum is meaningful even when base period EPS is negative or negligible);

• *EBITDA Momentum* (the same, measured as the change in the firm's EBITDA/base period sales);

• *Change in EBITDA Margin* (EBITDA/Sales in 2012 less the ratio in 2007);

• *Sales Growth Rate* (same, the change in sales/base period sales);

• *Free Cash Flow Generation* (same, cumulative five-year FCF/base period sales);

• *Return on Capital* (NOPAT/Average Capital, in the latest period);

• *Change in Return on Capital* over the five-year interval.

All the candidate measures (except the return measures and the change in EBITDA margin) are scaled by base period (2007) sales in order to align with MVA Momentum, which is also scaled by sales in the base period. The variables were regressed one by one against MVA Momentum in three ways. The first used the raw values. In the second, the variables were first ranked and the regression was performed on the percentile values. The third also used the percentile rank values but with the added requirement that the regression must pass through the origin—that is, the zero percentile scores for both variables must be the starting point on the regression line.

The percentile regressions test the ability of each variable to rank order MVA Momentum as opposed to literally predicting each observation. Requiring the percentile regression to pass through the origin sensibly asks how well the percentiles scores line up when they are forced to intersect at the starting percentile ranks and not arbitrarily along the way. That is the strictest test of alignment and will be accorded the most significance.[6] The slope of that regression line will also be telling. The closer it is to 1.0, the more MVA Momentum and the explanatory variable are aligning all through the percentile ranks. The findings are summarized in the previous table and chart.

As can be seen in Figure 3, EVA Momentum not only has

6. Forcing the regression to pass through the origin can result in negative R-squared. That is because R-squared is measured relative to the assumption no correlation exists between the two variables, and the squared errors against a flat line are summed as the reference deviation. If a regression line forced to pass through the origin leads to a greater sum of squared errors compared to the actual observations than the reference sum, then the R-squared of that regression line is negative. It is worse than assuming there is no correlation at all, which is the case with EBITDA Momentum, FCF Generation, Return on Capital, and Sales Growth.

the highest R-squared across all regressions, but it is by far the best at the percentile regression, which means it's the best measure to rank-order TSR. Moreover, the slope of the EVA Momentum percentile regression with MVA Momentum is exactly 1.0 where all the other measures have slopes less than 1.0. EVA Momentum is not only the best at explaining the rank order of wealth creation, it is the most completely aligned with it as well. This is as it should be. EVA is the only measure that has a predictable, actually mathematically grounded link with net present value. There is no reason to expect any of the other measures to explain wealth creation, except insofar as it happened to be correlated with EVA Momentum.

Summing Up

These findings can be seen as remarkably good news on a number of fronts. For the one thing, they refute those who would discredit the free market capital system as a lottery that lacks economic substance. The evidence presented here suggests that an underlying and understandable logic runs through how the stock market actually values corporate performance. Seen from a distance but not up close, the market can be appreciated as an incredible machine for weighing value and allocating resources in accord with long-established principles of corporate finance—namely, that corporate managers can maximize shareowners' wealth by maximizing NPV and economic profit.

Corporate boards, too, can find comfort in this. They are under considerable pressure to ensure corporate executive pay is in alignment with total shareholder return. And to do that, more and more of them are hitching more and more pay directly to TSR. But that is likely to be a great mistake. TSR says nothing about how to increase TSR, and it is highly distorted by changes in the market debt/equity ratios. It also cannot be measured by lines of business or for individual business decisions. It simply does not provide managers with any insights into how they can actually produce a higher shareholder return.

A far better approach is now possible. Boards can now structure incentive plans that reward managers for increasing EVA. Not only does that automatically forge a strong link between pay and TSR, as the governance watchdogs insist. More important, directors that pay for EVA are giving their managers a practical way to win. With the mission to increase EVA as the carrot, managers will seek to cut costs relentlessly but also intelligently, to invest capital carefully and with accountability, to use assets wisely and leanly, and to pursue all the profitable growth opportunities over the cost of capital instead of simply milking existing businesses for high margins and returns. Those are all key messages that need a voice, wrapped up in one measure. Equally important, EVA, or, more precisely, EVA Momentum, can be the pinnacle score in a management framework that can provide every manager with the practical, easy-to-understand information they need to make value-enhancing decisions.

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