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Applications in Real Options and Value-based Strategy

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VALUE-BASED MANAGEMENT

Managing for value has become the mantra of today's executive in the US and, increasingly, in other parts of the world, such as Germany and Japan. Companies as diverse as Siemens, Sony and Molson have publicly announced the formal implementation of economic value added (EVA)[1] management systems in their quest for the value-maximisation proposition.

Many academic writers, mainstream journalists and even analyst community members have interpreted these initiatives merely as an advance in metrics and measurement. But such a narrow interpretation would seem to imply little fundamental change to the behaviour of the many people responsible for the decisions and actions that create value. To function as a more robust measure of financial performance and related financial management tools to create value, EVA must be coupled with a powerful change to management processes, including planning, portfolio management, strategic and tactical decision making, and total compensation strategy.

Pitfalls of traditional performance measurement

The maxim "what gets measured gets managed" does not only refer to shareowner value. A review of businesses' favourite financial performance measures – and their pitfalls – shows that managers and executives should be very careful. While business schools have been preaching valuation concepts for decades, earnings per share and other traditional financial measures continue to rule supreme. However, these metrics have many risks.

Over-investment

Profit and profit margin measures often drive over-investment and vertical integration because they overlook capital and its cost. Increasingly, different businesses and business models consume varying levels of capital at

PANEL 1

WHY SHAREOWNER VALUE?

Shareowner value is all the buzz in business – move over total quality management. Activity-based costing and business process re-engineering too have been eclipsed by the value-bandwagon. "Valuespeak" now permeates annual reports, mission statements, etc. Why all the fuss? What are companies saying when they climb aboard the value bandwagon? What about stakeholders? Who are these demanding shareholders and what's in it for us?

Asia's recent economic crisis illustrates the risk to social and economic stability and standards of living created by a poor corporate governance climate – the measures, incentives, tools and controls that support decision making must be consistent with strategies to maximise shareowner value. Prolonged periods of pervasive capital misallocation and mismanagement destroy massive amounts of wealth and undermine the economy.

One of the most basic and fundamental tenets of capitalism is the obligation to maximise shareowner value. This is nothing new. An expectation of a return is created with every dollar raised and invested. A tacit promise to maximise value is also made to shareowners with each dollar of profit that is retained rather than distributed. Thus, the litmus test behind any decision to raise, invest, or retain a dollar must be to create more value than the investor might have achieved with an alternative investment opportunity of similar risk. This is, of course, all motherhood and apple pie.

A simple home-front example shows the importance for managers and employees of keeping sight of the need to manage for value. What would happen if "Brick Bank" paid only a 5% rate of interest on savings accounts, while "E-Bank" offered 15% on money market accounts of virtually equal risk? Obviously, a 15% rate of return is much better than 5%, when all else is equal. Consequently, many people will storm into Brick Bank, withdraw their life's savings, and march down the street to E-Bank.

This example illustrates that capital is a scarce resource that all businesses, and even government agencies, must compete for and efficiently manage. This means that they must provide customer-valued products and services effectively and efficiently to maximise the utility of their invested capital. The limited supply of, and liquid markets for, capital require that its users maximise its value – maximise shareowner value, or face the flight of capital to more attractive opportunities.

If managing for value is embracing the interests of owners, what then of the interests of other stakeholders? Let's start with a look at who these owners are, for they are not rich young professionals on Wall Street. Our

mutual funds, pension plans, life insurance policies and many small investor holdings represent the vast majority of stock ownership. Our largest institutional investors represent the savings of everyday citizens. We invest our savings and bear risk, in the hope of the best return possible.

But this need not imply a conflict between the interests of customers, employees, owners and the managers, executives and directors who act as stewards of our savings. Fashionable shareowner- stakeholder discussions belie a confusion of means and ends. Value maximisation, the heart of economic growth, is a long-term proposition that delivers higher economic output and prosperity through productivity gains, employment growth and higher wages. The interests of stakeholders and of society are best served when our scarce resources are put to their most productive uses. Management's most important mission is to maximise shareowner wealth; managing for value directs our scarce resources to their most promising uses and most productive users. The societal benefits of managing for value are clear. The more effectively our scarce resources can be deployed and managed, the more robust will be our economic growth and the rate of improvement in our collective standard of living. It is no secret that weak systems of corporate governance, inhibited market discipline, and a general apathy toward the value maximisation imperative have played an important role in the Asian economic crisis.

The challenge facing investors is to place their savings with stewards of capital who will manage to the value-maximising proposition. This ensures an efficient allocation of our limited supply of capital. But distinguishing the value-maximisers from the value-destroyers has always been at best an art form. A look beyond the glossy pages to the proxy can be a good start. How much do your stewards – the Board and management – have at stake? What tangible factors drive their personal returns? Is there any mention of accountability for past goals?

Another risk that our investments in many companies face is the exaggerated reliance on signals from accounting information. Traditional accounting based performance measures and incentives not only encourage rampant short termism among managers, but also lead to other forms of dysfunctional behaviour. The systematic underpricing of capital by accounting has also driven broad capital misallocation and mismanagement.

Globalism presents investors with both an opportunity and a challenge. As historically insular product, labour and capital markets become increasingly global, companies will continue to face increasing competitive pressures. Under pressure to perform, institutional investors are warming to the notions of shareowner activism and heightened corporate governance. Market liquidity and the emergence of more sophisticated and demanding institutional investors have made the consequences of destroying shareowner value much more material to today's employees, executives and directors.

varying costs. Managers are often drawn to higher margin businesses that, on the surface, may seem more attractive. For example, profits are often improved with newer production technology – but they must be, to compensate for the higher levels of investment. Because traditional financial measures ignore the returns that shareholders expect, any corporate project with a positive – but not necessarily adequate – return above zero can improve a manager's margins, unit cost, profit and productivity measures. However, such a project can also destroy value.

Over-production

Traditional measure of unit cost, utilisation and income frequently promote troublesome over-production, particularly at the end of a year or quarter. Producing to capacity rather than to demand often appears to reduce costs, yet doing so can also raise the cost of invested capital. The bias towards over-production, despite demand, is exacerbated by absorption accounting practices, which convert operating costs into inventory. This practice gives the illusion of lower costs from the distorted perspective of a cost per part, while creating operating burdens (eg, uneven and inflexible production) and vast quantities of unnecessary inventory. Foregone revenue is endemic to this vicious circle, because heavy discounting and trade promotion are needed to unload the extra product, often at the end of each quarter.

Feed the dogs, starve the stars

Many managers have a strong affinity for percentages because of their intuitive appeal. Unfortunately, a focus on percentage margins and rates of return starves the "stars" and feeds the "dogs" (see Table 1). A low-return "dog" business might be motivated to pursue return-expanding growth that, if below the cost of capital, would destroy value. A high-return "star" business might overlook or reject return-diluting growth that, although above its cost of capital and therefore additive to value and EVA, will decrease returns.

Table 1. Traditional performance measures "starve the stars" and "feed the dogs"

	"Feed the dogs"			"Starve the stars"		
	Bus. "A"	**Bus. "B"**	**Sum**	**Bus. "A"**	**Bus. "B"**	**Sum**
Sales	US$250	US$133	US$383	US$1250	US$1000	US$2250
Margin	20%	30%	23%	20%	10%	16%
Income	US$50	US$40	US$90	US$250	US$100	US$350
Capital	US$1,000	US$500	US$1,500	US$1,000	US$500	US$1,500
Return	5%	8%	6%	25%	20%	23%
Capital cost at 10%	US$100	US$50	US$150	US$100	US$50	US$150
EVA	(US$50)	(US$10)	(US$60)	US$150	US$50	US$200

Service economy

Traditional financial measures, being based on traditional business models, have not kept up with the pace of change. New business models are often based on services, outsourcing, partnerships and other innovative ways of doing business. Therefore, traditional financial measures are inherently biased against the new service economy. Their blunt nature is too simplistic, creating impediments to profitable growth in a world where more and more service-oriented businesses are being designed around razor-thin margins, but with low capital investment. Similarly, a bias against viable, long-term investments and economic growth can result from a simplistic, near-term income focus.

Poor decisions

Traditional financial measures exclude the shareholders' investment in the business; an incomplete measure that ignores capital is entirely inappropriate to handle the many business decisions that trade-off between profit margin and capital utilisation. Traditional financial measures confuse accounting anomalies with the underlying economics of business. When tied to incentive compensation, this can lead to dysfunctional behaviour among managers and top executives alike. A cellular company delayed the rollout of its digital network conversion by several months to avoid depreciation, despite the fact that the cash was already spent and competition was stealing customers with digital service. One company executive once explained that, "in business, you must often make decisions that you would never make if you actually owned the company." A lesson overlooked by business schools is that accounting often drives major business decisions despite – and not because of – the economics.

What is EVA?

Peter Drucker writes, "There is no profit unless you earn the cost of capital. Alfred Marshall said that in 1896, Peter Drucker said that in 1954 and in 1973, and now EVA has systematised this idea, thank God." (Drucker, 1998.)

Economic value added, or EVA, is a measure that enables managers to see whether they are earning an adequate return. Where returns are lower than might reasonably be expected for investments of similar risk (ie, they are below the cost of capital), EVA is negative, and the firm faces the flight of capital and a lower stock price.

Quite simply, EVA is a measure of profit less the cost of all capital employed. It is the one measure that properly accounts for all the complex trade-offs, often between the income statement and balance sheet, involved in creating value. EVA is also the spread between a company's return on and cost of capital, multiplied by the invested capital:

$$\text{EVA} = (\text{rate of return} - \text{cost of capital}) \times \text{capital}$$

For example, a US$1000 investment in a hot-dog stand produces a 5% return, where investments of similar risk elsewhere can earn 15%. The EVA from this case would be:

$$\text{EVA} = (5\% - 15\%) \times \text{US\$1000} = -\text{US\$100}$$

An accountant measures profit earned, whereas an economist looks at what could have been earned. Although the accounting profit in this example is US$50 (5% × US$1000), there was an opportunity to earn US$150 (15% × US$1000).

Under EVA, each business is effectively charged by investors for the use of capital through a "line of credit" that bears interest at a rate equal to the cost of capital. Therefore, shareowner accountability is effectively decentralised into the operating units. EVA simultaneously focuses on both the profit and loss statement and the balance sheet, and can be tailored to remedy accounting anomalies that fail to reflect economic value. Finally, EVA sets a required rate of return – the cost of capital – as a hurdle rate below which performance is unacceptable.[2]

Therefore, a perhaps more meaningful way for operating managers to think of EVA comes from multiplying through by capital:

$$\text{EVA} = \text{operating profit} - \text{a capital charge}$$

where,

$$\text{capital charge} = \text{cost of capital} \times \text{capital}$$

For example, if a US$1000 investment in a hot-dog stand yields a US$50 annual profit, compared to a US$150 opportunity elsewhere, EVA can be expressed as:

$$\text{EVA} = \text{US\$50} - \text{US\$150} = -\text{US\$100}$$

To summarise, EVA is the only operating measure to account for the many income statement-balance sheet trade-offs involved in creating value because of its simultaneous focus on profit and capital. Under EVA, every business unit is, in effect, explicitly charged for the use of capital through a "line of credit" that bears interest at a rate equal to the cost of capital. This effectively decentralises shareowner value accountability well into the operations. EVA also sets the expected return, the cost of capital, as a hurdle rate below which performance is unacceptable. This clearly identifies the benchmark to create shareowner value.

Donaldson Brown, Chief Financial Officer of General Motors, wrote in 1924,"The objective of management is not necessarily the highest rate of

return on capital, but … to assure profit with each increment of volume that will at least equal the economic cost of additional capital required."[3]

Although in any given business there are countless individual operating actions that can create value, eventually they must all fall into one of four categories measured by an increase in EVA. Specifically, EVA can be increased through the following four means.

1. *Improving the Returns on Existing Capital.* This might be achieved through higher prices or margins, more volume or lower costs.
2. *Profitable Growth.* This might be achieved through investing capital where increased profits will adequately cover the cost of additional capital. Investments in working capital and production capacity may be required to facilitate increased sales, new products or new markets.
3. *Harvest.* This might be achieved through rationalising, liquidating or curtailing investments in operations that cannot generate returns greater than the cost of capital. This might be through divestitures or through withdrawing from unprofitable markets.
4. *Optimise Cost of Capital.* This might be achieved by reducing the cost of capital but maintaining the financial flexibility necessary to support the business strategy through the prudent use of debt, risk management and other financial products.

EVA is not just a performance measure. Properly implemented, EVA is much more: it is an integrated performance measurement, management and reward system, encompassing the full range of business decision-making and moving shareowner accountability to the same level as decision-rights. Above all, it is the centerpiece of business literacy and for this reason, corporations throughout the world now use EVA to remake governance from within.

EVA management system

An increasingly popular topic among institutional investors, managers, legislators, regulators and academics is that of corporate governance. While a hot issue such as this is typically interpreted differently by different people, a broad definition formulated by Kenneth Scott of the Stanford University Law School asserts that, "Modern corporations, to take advantage of technological progress and scale economies, are large organisations requiring heavy investment. The amounts of capital required often can be raised only by pooling the savings of a multitude of investors, who rely on others to manage their investments and run the enterprise. The institutions – the particular set of legal rules, incentives, and behaviors – that support and underlie that reliance by investors constitute the system of corporate governance in a given society."[4]

A corporate management system is the governance framework that defines the measures, incentives, tools and controls supporting decision-making consistent with a company's strategies to maximise shareowner

value. Many management systems, based on archaic metrics and accounting conventions, are quite adept at discouraging, if not destroying, value. These systems were designed primarily as reporting and control systems for lenders and subsequently adopted by managers as variance measurement tools in the centralised command-and-control organisations more suited to less turbulent times.

Despite the best of intentions, many managers fail to create value for many of the following reasons.

- ❑ The performance measures are too blunt and not systematically tied to value.
- ❑ There are too many performance measures, often giving conflicting signals and failing to prioritise or reveal connections, therefore hindering efforts to focus and cut through the complexity.
- ❑ Targets are often set through a counter-productive negotiation process that encourages managers to understate and under-perform their business's true potential.
- ❑ There is no integration of the incentive, planning, capital budgeting and reporting processes, or the operating and strategic levers that drive the business.
- ❑ Bonus plans are short term oriented and offer too little risk and reward.
- ❑ Inadequate attention has been given to employee education and business literacy.

Companies use a variety of conflicting measures such as earnings growth, earnings per share, return on equity, internal rate of return, market share, margin and revenue. Being less correlated to shareowner wealth, these measures are therefore more likely to lead to incongruent decision-making. Conflicting messages from different measures set the stage for internal conflict, dysfunctional behaviour and the sub-optimisation of total enterprise value.

An EVA management system aligns the interests of employees with shareowner value to promote and reward high performance. With a focus on organisational and behavioral change, this "rewires" the brain of companies to:

- ❑ decentralise ownership accountability;
- ❑ develop strong business literacy throughout the workforce;
- ❑ confer economic discipline at all decision-making levels of the company; and
- ❑ institutionalise a culture of high performance.

In 1998, Paul Romer of Stanford University, an expert on economic growth, reported that, "I was talking … with Mike Volkema … they (Herman Miller) have had great success with EVA. It's a good illustration of how abstract ideas, codified formulas, can create value in a company."[5]

An EVA management system must establish clear, accountable links between strategic thinking, budgeting and capital planning, daily operating decisions, incentive compensation, and shareowner wealth. The power of such a system rests in the fact that it creates commonalty across processes, ultimately leading to employees who think and act like owners.

So, why not just turn employees into owners? The broad use of stock and stock options throughout the workforce has increased dramatically in recent years, and yet, contrary to the myopic view often espoused, real success has been elusive. Direct ownership may give employees a share in the enterprise value, but this is well beyond the sight lines of most employees. It also fails to provide the necessary linkage between action and results ie, the operational levers and firm value. Finally, while everyone wants to share in a bull market, the syndication of market risk by under-diversified employees in a bear market can be quite discouraging.

Strategically, enterprise value is not maximised solely through the maximisation of current operations value (COV), but through the simultaneous maximisation of the sum of *both* COV *and* future growth value (FGV), including the value of real options.

While the valuation of internet stocks might be interpreted as proof of a forward-looking stock market, leading business strategists are concerned that many of today's corporations remain overly fixated on the near term.[6] The implications for business strategy, and for the supporting financial policy, financial management and compensation strategies, are far-reaching.

VALUE-BASED STRATEGY

The importance of Value-Based Management to strategy is perhaps best understood by examining three "real-world" cases in fallacious strategic analysis and decision-making.

The first case is a global automotive supplier that ran into trouble in the first half of the 1990s, having made a decision to embark away from its roots on a bold new strategy. The Company had enjoyed success in the original equipment (OE) side of the business, primarily supplying the "Big 3" assemblers, making it a "Tier 1" supplier. It enjoyed a reputation as a good manufacturer, having successfully implemented lean production concepts in some of its plants. However, it is common knowledge that the aftermarket side of the automotive parts business is a much higher margin business than manufacturing, offering 10–20% as opposed to 5–10% margins. Conventional wisdom also has it that this business is at least countercyclical, if not even less cyclical than the OE business. The Company decided to focus on the aftermarket business; the OE guys became the poor cousins. Yet analysis then determined that margins were better still even further down the "value chain". Indeed, aftermarket distribution channels are a myriad, with multiple steps, buffers and handling points in the system all offering much higher margins. Therefore, the Company embarked

PANEL 2

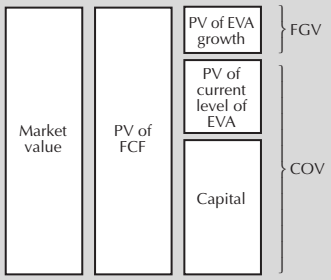
WHEN A PENNY MATTERS: A FRAMEWORK TO LINK PERFORMANCE MEASUREMENT, VALUE AND STRATEGY

Our pockets have been increasingly laden with change in recent years – and far too many pennies. Many complain that pennies are simply not worth the effort. Why then, when a company announces that it will miss quarterly earnings estimates by a mere penny, does the stock plummet? When does a penny matter?

Simplistically, one can express a company's value as the present value of all future cashflow.[1] While net present value concepts are more easily and therefore commonly applied to fixed income valuation (eg, the value of bonds), the same concept also holds for stocks, albeit with much less certainty in the forward numbers. Therefore, a business generating US$100 per year, every year, can be valued into perpetuity as US$1000, assuming a 10% cost of capital, or time value of money (US$100 ÷ 10% = US$1000). This base, or zero-growth, case implies a "multiplier" of 10 times operating cashflow, and is the current operations value (COV).

Now, let's try a growth case where operating cashflow grows at a rate of 5% per year, forever. While many of us might think that forever is a long time, it may not be long enough to justify some of the recent internet stock prices! This business can be simply valued on a present value basis at US$100 ÷ (10% – 5%), or US$2000. This growth case implies a multiplier of 20 times and happens to illustrate a price level common to today's marketplace where many stock prices imply a multiplier of 20 times or more. In this case, the market has based one half of the stock price on the present value of current operating cashflows, forever, and the other half on growth expectations above this level – ie, fifty percent of the value is COV, while the remainder is future growth value (FGV). The FGV term subsumes not only *expected* growth, but also implicitly values any *real options*. For example, the 5% growth assumption might really be a proxy for a 90%

A. Enterprise value as the sum of current options value (COV) and future growth value (FGV), including real options value



likelihood of no growth, and a 10% chance of 50% growth. Figure A illustrates the general form of this valuation framework.

When a company misses its earnings number, what are the implications for its net present value? If the miss has absolutely no implications for the future, the value of the stock is reduced by only one cent. If the miss is expected to persist for each of the four quarters, the value of the stock is reduced by four cents. If the four cent annual reduction is expected to be permanent, then we can apply our multiplier of 10 times to show that the stock value is now reduced by 40 cents.

However, if the shortfall has implications for growth opportunities, we might expect a much larger impact, like our example with a 20 times multiplier. A one penny shortfall on the quarter, or a four cent shortfall for the year, can cause not only a 40 cent reduction in the perpetuity value, but another 40 cent reduction in the growth value – a penny with an 80 cent impact![2]

A healthy dose of prudence on the part of analysts and investors can lead to an even larger stock price impact than what we have developed thus far. This is what many on Wall-Street will refer to as the "where there's smoke, there's fire" investment hypothesis. Managers within many public companies have significant financial incentives to do just about anything to shore up disappointing operating cashflows to avoid falling short. Public results often understate how bad things really are. For example, pharmaceutical companies have been known to cut their research and development budgets in poor times to boost their earnings, despite the fact that such "spending" is really "investing". Other tactics can include asset dispositions, and heavy-handed cuts to advertising or other marketing costs.

The final reason why even a one penny shortfall can have such a profound and seemingly exaggerated impact is that aggressive, albeit legal, accounting practices have been employed to salvage earnings numbers. Several cases have received considerable press in recent years. Just a few examples of the games of which investors must be wary are changes in revenue recognition; netting offsetting gains and losses; and reversals in acquisition, restructuring, warranty, bad debt, inventory and actuarial reserves. Therefore, when a company does miss by a penny, what we see is often only the tip of the iceberg, potentially warranting a dramatic, downward revision of future cashflow expectations, and dramatically lowering future growth values and stock prices.

1 This can also be expressed as the mathematically equivalent sum of capital and the present value of all future Economic Value Added (EVA).

2 The current operations value can be also expressed as the sum of capital invested, plus the present value of current EVA into perpetuity, with no growth. The nominal zero-growth assumption implies decay in real terms.

on an international retail strategy which ultimately failed, leading it to replace its executive team a few years later.

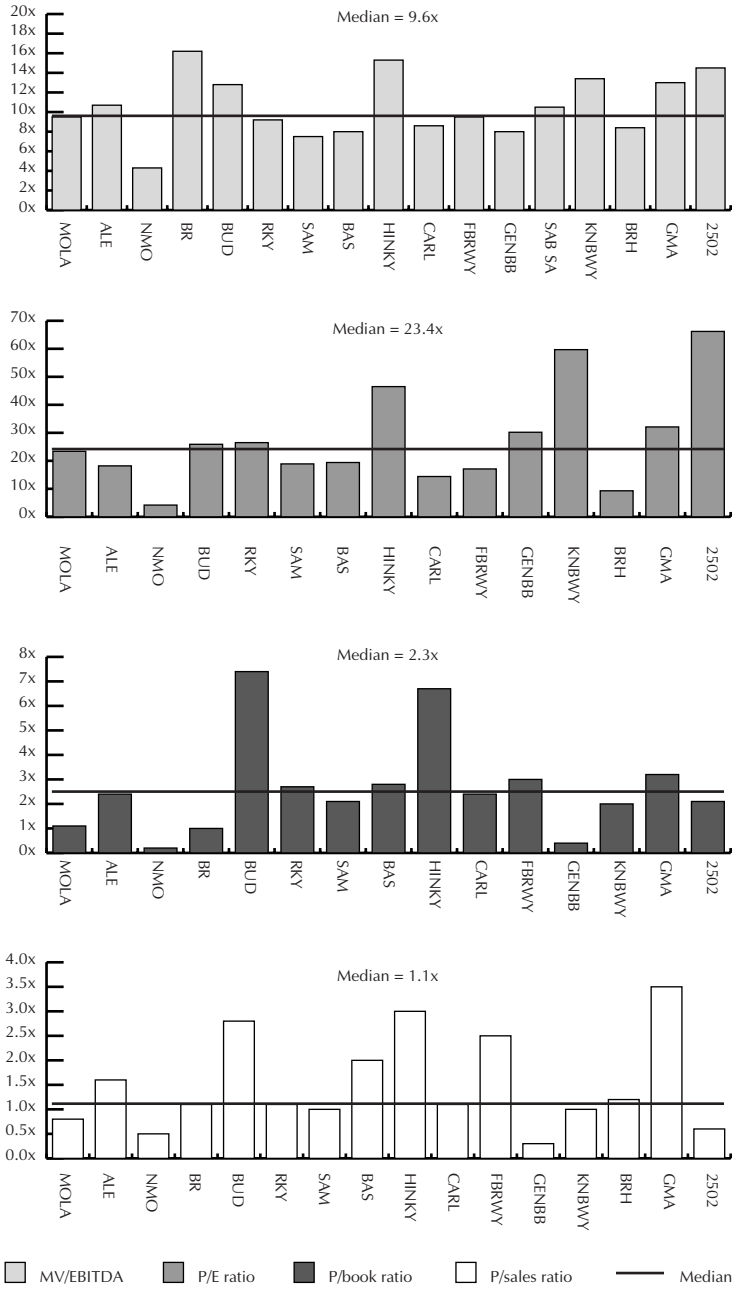
The second case is a national brewer that found market share stalling and profitability waning under the weight of a proliferation of brands. A consultant was promptly called upon to examine the portfolio and refocus the Company's strategy. It took no time at all to determine that several big-name import brands were only marginally profitable. Apparently, the margins on non-owned, non-brewed brands were far lower than the margins on brewed, owned and brewed, non-owned brands. Also, partly because they were growth brands, the non-brewed brands were a distraction on scarce management resources. A recommendation to trim these brands from the portfolio was made, but luckily, not followed.

The final example is a high growth manufacturing company with blanking, stamping and assembly operations. Two new plants were added to the business – one as part of a much larger acquisition and one through direct investment – and these shared a similar product and customer. The greenfield "South" plant was quite a success – investments in automation and state-of-the-art technology led to a very low cost per unit, high efficiencies and high margins of 10–15%. Yet, the acquired "North" plant seemed barely profitable, with margins of only 1%! Company management heavily weighed the fate of the North plant within their portfolio.

A Value-Based Management analysis sheds new light on these examples. In the case of the manufacturing company, it was observed that the unique supply agreements of the North plant were such that it enjoyed *negative* capital employed. While its margins were only about 1%, return on capital employed was *indeterminate* and its economics were very good! The brewery's only growth was in its highly economic, non-brewed imports, where very little capital were needed (no breweries being necessary). The automotive supplier stumbled under the load of the massive capital expenditures, inventories and receivables required for its new international retail strategy. The higher margins were more than offset by the capital intensity of the business, making its economics attractive only to the "category-killers" well-versed in retail distribution strategies and tactics.

An appreciation of fundamental valuation concepts and value-based measures of performance (EVA) avoids such strategic missteps. With little appreciation or understanding for valuation or decision analytics, it is not surprising that people work from intuition. Unfortunately, strategy often seems a vocation for innumerates who lack the disciplined methodology or analytic rigour practised in the sciences. In business circles, the term "strategic" seems to be a synonym for negative net present value. However, *analysis paralysis* – when the analysis starts to resemble an end rather than the means and indecision sets in – is just as deadly. Therefore, Value-Based Strategy and Real Options must be employed to bring discipline and rigour to support, but not encumber, strategic thinking and decision-making.

1. Traditional valuation metrics: global brewing



Limitations of traditional valuation frameworks: global brewing

The workings of the markets are a mystery to many. Several of the market stories that get picked up and interpreted by the media do not help: market volatility and the contradiction in values between those in and out of favour add to the notion of general market irrationality. All this noise leaves executives and strategists looking to investment bankers to identify the actionable value-drivers upon which to build and gauge alternative strategies and plans.

But the traditional valuation metrics are clearly flawed. As discussed earlier, the income statement measures fall short in many regards and are therefore not ideal indicators with which to gauge the best laid plans.

Not only are the measures themselves flawed – being incomplete, they are more likely to lead to incorrect signals and actions – but they are also highly subject to error. Table 2 illustrates these metrics for the global brewing industry, showing a high standard deviation in results for each approach. The EBITDA multiple is a ratio of enterprise market value (MV) to earnings before interest, taxes, depreciation and amortisation (EBITDA). As a rough proxy for operating cashflow, it works the best, while the sales multiple works the worst. However, each shows wide dispersion.

Finally, the strategic implications of the multiples themselves are not always clear. For example, many executives struggle with whether they're looking for highly accretive strategies and investments, that typically reduce multiples, or a higher multiple which typically comes with weaker, or even dilutive, earnings. This conundrum can apparently lead to a perpetual deal-machine for investment bankers. For example, one Michigan manufacturer spun off, then reacquired and then again sold one of its largest business units within a five year period.

Organisational software strategies: pharmaceuticals

In recent years, the market run-up has been partially fuelled by a run-up in current operations values. This has been evident in the broad EVA growth of the market, several industries and a majority of companies. However, the current operations value of the market has not kept up with the market in total, as future growth values have increased overall. A larger proportion of the market's value is now predicated on profitable growth (both linear and real options value). For example, America Online's value is roughly 96% future growth value, with only 4% of its market value explained by the present value of its current operating cashflow, ie its current operations value.

Primary resource industries and basic durable goods producers have not fared as well in the marketplace, with little increase in Market-to-Capital ratios, and little, if any, appreciation in future growth values. These industries are ones that often fail to earn their cost of capital on capital that is very tangible rather than flexible. They are characterised by heavy

Table 2. Market value-to-capital ratios for a sample of industries

	Market value per capital US$	Future growth as % market value	EVA per capital US$
Computer software and services	US$8.20	80%	6.7%
Pharmaceuticals	US$6.60	71%	9.1%
Personal care	US$4.40	66%	5.1%
Beverages	US$4.30	70%	3.1%
Mean	**US$3.20**	**63%**	**0.2%**
Other non-ferrous metals	US$1.20	63%	–5.6%
Cars and trucks	US$1.20	33%	–1.9%
Forest products	US$1.10	53%	–4.8%
Aluminium	US$1.00	78%	–7.8%
Steel	US$0.90	17%	–2.5%

investments in "rigid" capital, ie, investments that are sunk or irreversible, offering few real options through growth, flexibility or deferral.

Table 2 shows that much of the advance has been across industries where "flexible" capital prevails, and where investments are intangible. For example, Research and Development (R&D) is a large percentage of sales for biotechnology (41%), software (18%), pharmaceuticals (11%), and electronics (6%) industries. Brand and franchise values, and organisational "software" (covering capabilities, processes and competencies) can also be considered flexible capital.

General Electric (GE) and Wal-Mart utilise organisational "software", ie, a platform option to expand and replicate proven success on a broader scale. Pharmaceutical companies invest in a pipeline of new drugs, constituting a portfolio of new product options. Beverage companies have growth options to carry strong brands into new markets. A host of studies have shown that R&D returns are significant, and that the stock market recognises and rewards R&D investment.[7] The pharmaceuticals therefore carry a significant premium in their values (see Table 3). Nearly three-quarters of the industry's value is premised on the present value of profitable growth ie, positive NPV (Net Present Value) projects that do not yet exist – the industry pipeline. Unlike the aluminium industry, this result is not a skewed result due to any lack of current profitability – the industry exceeds its cost of capital by 11%. In fact, the result appears related to the R&D intensity (11%) of the industry.

A sampling from the pharmaceutical industry clearly shows that even within the industry, R&D intensity drives valuations. Four of the five premium-valued companies also invest more heavily in R&D, with the smaller Warner-Lambert (now merging with American Home Products) being an obvious exception. Schering-Plough and Eli Lilly seem to be the best examples of executing strategies to maximise *both* current operations values (evidenced by their high returns above the cost of capital) *and* future growth

Table 3. Pharmaceutical valuations, performance & R&D intensity

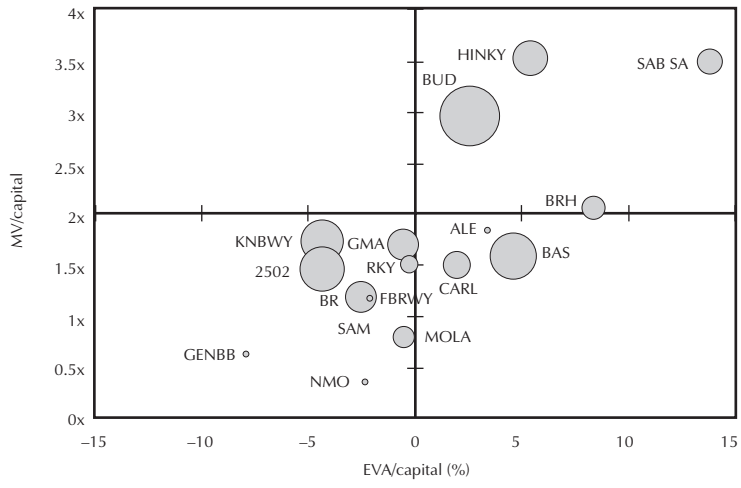
Company	Market value (US$MMs)	% COV	% FGV	EVA per US$ capital	R&D as % sales
Pfizer	162,876	15%	85%	7%	17%
Schering-Plough	81,778	21%	79%	26%	12%
Warner Lambert	64,418	24%	76%	7%	9%
Eli Lilly	100,167	27%	73%	13%	19%
Pharmacia & Upjohn	29,858	27%	73%	–2%	17%
Median	**90,972**	**27%**	**73%**	**11%**	**11%**
Bristol Myers Squibb	135,233	27%	73%	16%	9%
Abbott Labs	77,925	33%	67%	13%	10%
Johnson & Johnson	116,963	34%	66%	9%	10%
Merck	182,720	35%	65%	18%	11%
American Home Prod.	81,462	43%	57%	7%	12%

values (a high percentage of total value stems from future growth expectations, partly due to high R&D intensity and effectiveness).

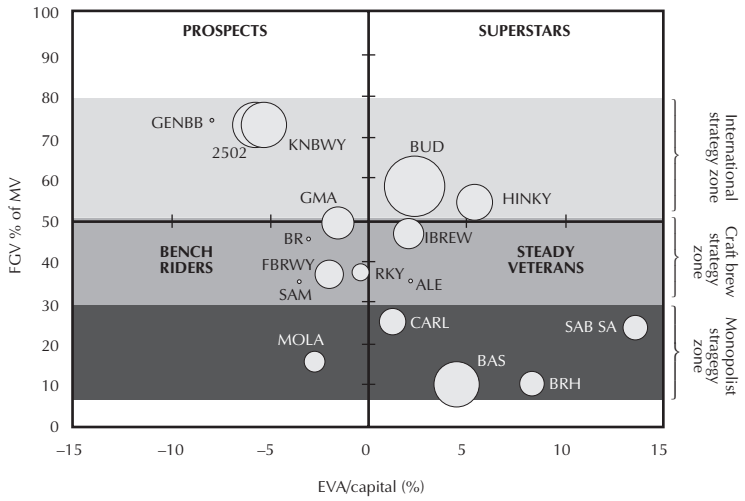
Value-based strategy application: global brewing

The valuation (market value per dollar of capital) and performance (EVA per dollar of capital) of the major players in the industry is depicted in Figure 2. Brahma (BRH) and South African Breweries (SAB) each enjoy monopolistic market shares and earn 10–15% more than their costs of capital – SAB also has the highest asset turns in the industry. Bass, Heineken (HINKY) and Busch (BUD) are the next highest performers in terms of

2. Valuation versus performance: global brewing



3. Future growth values versus performance: global brewing



EVA per dollar of capital, with a 5% return premium over their cost of capital. While Bass and Busch accomplish this through margins, Heineken employs a very different export strategy. Premium pricing is offset by higher costs, but asset turns is very high, leading to exceptional performance. In general, the positive EVA companies trade above twice book, while the others trade at one to two times book.

Figure 3 recasts the industry with a new vertical axis and the current operations values removed from each of the market values, leaving only the future growth values. The top left quadrant are "Prospects"; performance is poor (ie, negative EVA) but expectations for improvement are high.

In the bottom left quadrant are the "Bench Riders", where performance is poor and valuations are low ie, future growth values are low. The bottom right quadrant has good EVA, but values remain low, there being little upside opportunity. The real options afforded to others are lacking, so this quadrant is therefore labelled "Steady Veterans". Finally, in the top right quadrant are the "Superstars", exhibiting high performance (EVA) and high valuations, ie, future growth value.

Despite, or perhaps because of, their high returns, Brahma and SAB market values imply very modest expectations for future growth values. Alternatively, the extremely poor all-round performance of Asahi (2502) and Kirin (KNBY) drives high expectations for improvement, rather than growth. Busch and Heineken dominate the "Superstar" quadrant, with Interbrew (IBREW), a private concern with public debt and interpolated market value likely to be in the same league.

Three valuation zones that transcend the performance effect on valuations emerge from the picture. In general, the monopolists are valued as being market constrained, with few growth options available. In reality, most of them have been creating international growth options, but at this point they are both small in size and reasonably well out-of-the-money – market entry prices have been steep and these companies have no proven ability to penetrate emerging or mature foreign markets. In fact, given their domestic situations, their core competencies are more likely be in operational excellence rather than marketing.

The top valuation band applies to the global strategies of those players who, like Busch and Heineken, manage a portfolio of in-the-money international growth options, although each execution differs between Busch's direct investment and Heineken's export strategy.

Finally, the glamorous world of "craft brewing", typified by Sam Adams (SAM) and Sleemans (ALE), lies in the middle, having been accorded some future growth value, but far less than either the more scalable global brewers or the equity markets in general.

So, what prescriptive insight does this study provide? Should each of the brewers run out and buy into the Indian, Polish or Chinese markets? As we have seen, the price of these options combined with a lack of expertise has not made this a good get-rich-quick bet. Additionally, Noble China (NMO) appears to have made a disastrous enough foray into the Chinese market to give others cause for caution. Until brewer/marketers can show true success at home, they might be best deferring their international growth options.

Real options application: automotive platform bidding

Let's move from big-picture value-based strategy to the micro-level – a real-world application in new business quoting. For example, in an automotive platform bidding opportunity, a large US assembler planned the launch of the "GMT666" truck platform, and solicited bids for a structural system. The assembler anticipated a volume of about 5 million units over a 5 year life, and expected to pay its supplier about US$600 per unit. A structural systems supplier put a team together to look at this opportunity, and, determining that a US$400 million capital investment was required to support the bid, developed the EVA and NPV analysis of Table 4. Due to the large investment and low margins, the projected volume was not sufficient to provide a positive NPV, as EVA only reached the cost of capital by about year three.

However, the lead platform engineer knew that volume projections are fraught with uncertainty – launch dates may be delayed, demand may be unexpectedly high, etc. Remembering something she had read about uncertainty analysis, she re-ran the analysis with the same expected volumes, but used a Monte Carlo simulation to make the volume assumption a "live" variable. She looked at relevant historical platform volumes and

Table 4. Initial GMT666 platform EVA & NPV analysis

	0	1	2	3	4	5
Volume (MMs)		1	1	1	1	1
Revenue (US$)	600	600	600	600	600	600
Costs		577	577	577	577	577
NOPAT		23	23	23	23	23
Capital	400	320	240	160	80	0
Capital charge		40	32	24	16	80
EVA		–17	–9	–1	7	15
PV(EVA)		–16	–8	–1	5	9
NPV	–10					

determined the data fitted a lognormal distribution with a standard deviation of about 30%. While the NPV did not change, she determined that the investment had a 50% probability of being positive, within a potential range of negative US$25 million to positive US$75 million.

However, the engineer also realised that in many cases, a platform is "freshened up" and re-launched at the end of its initially-planned life. As the supplier to the original platform, they could easily be best positioned for a successful follow-on supply contract for a successor chassis. She identified a second opportunity embedded within this supply contract opportunity in that many of the more successful truck platforms have spin-off models eg, extended cab, 4×4 and sister models. Finally, she identified a third embedded opportunity in the assembler's overseas affiliates, which was rather a long shot: if GMT666 derivatives were ever launched by the assembler's European and Japanese companies, again, they could be best positioned for the new business.

After attending a two-day conference in New York, the platform engineer realised that the opportunities embedded within the original supply contract represented real options which could be quantified for their contribution to value within the economic analysis of the platform bid.

Therefore, she increased the initial investment by a further US$100 million to add sufficient flexibility to the investment for the original bid (to support the platform life extension real option). She also determined that an approximate volatility of 60% was reasonable to capture the volatility, and a volume of 2.5 million units over five years at US$550.

While a static NPV analysis assigns a value of –US$10 million, the option value appropriately captures the value of flexibility: +US$24 million, bringing the NPV of the bid to a positive US$14 million, even without capturing the value of the real options that were more of a long-shot. Therefore, while the initial analysis required an uncompetitive price, the extended NPV analysis, incorporating even only the most likely real option, showed the business to be attractive.[8]

FINANCIAL STRATEGY

To meet the relentless escalation of shareholder expectations arising from a decade-long bull market, many companies are turning to share buybacks.[9] Is this tactic part of a shareowner value strategy, or just another chapter from the earnings-per-share manipulation playbook? While earnings-per-share growth "window dressing" has nothing to do with value, there may be a sound economic rationale to share buybacks. However, this tactic may not serve all equally well.

Share repurchases are a more tax efficient form of cash distribution than any form of dividend. They can also enhance shareowner value through a combination of improved capital structure, reduced agency costs and signalling effects.[10] While financial strategy is often narrowly interpreted as an exercise in the cost of capital *minimisation*, in practice, the determinants of financial policy must support enterprise value *maximisation*. Certainly, the firm's cost of capital and any resulting impact on firm value is one important element, but financial strategy must also support the company's business strategy and consider financial flexibility, agency issues, flotation costs, signalling and clientele considerations.[11]

Target capital structure

Repurchases can quickly and decisively move a company closer to its target capital structure, potentially creating value through the benefit of the tax shield of debt. The after-tax cost of debt is well below the expected return on equity, reducing the weighted average cost of capital and increasing value. However, debt reduces financial flexibility, especially in turbulent times, and this may lead to foregone opportunity. While debt increases *current operations value*, *future growth value* can be constrained, risking a sub-optimisation of total enterprise value.

While one supplier might achieve their lowest cost of capital, and highest current operations value, at a level of debt consistent with a B or BB rating, the option value of one-time investment opportunities with positive NPV in either growing or consolidating industries might dictate a near investment-grade financial policy. Indeed, this is the prevailing strategy among many automotive suppliers, for although cost of capital and current operations value may suffer, this can be more than offset by increased opportunity for future growth value. Therefore, optimal capital structure is partially dependent on the financial flexibility required to execute their strategy.

For example, current thinking among OE automotive suppliers, especially the leading Tier One suppliers, is that an active role within the industry consolidation will facilitate the extraction of further economic profits – partly due to increased bargaining power, partly to leveraging specific knowledge, and partly to process capabilities and a move to modular supply. Anticipated benefits include better design-for-manufacture; modular product integration and sequencing; supply-chain integration and

logistical coordination; and the improved utilisation of fixed costs and capital by leveraging across common suppliers.

While no rigorous literature empirically supports these expectations, they are intuitive; the frequently cited "pilot" is the success of Lear, JCI and Magna with the modular supply of seating and interior systems. However, even Tier Two players in this segment may have economic out-performance – is it a function of the segment, or of operational excellence, bargaining power or exogenous factors?

Agency costs

Agency issues are a determinant in both the target capital structure and the distribution policy decision. Mature companies often generate significant levels of free cashflow, leading to excess capital, with a tendency to retain and then waste capital through over-investment and diversification schemes. The need to either service debt or pay dividends can alleviate a company's inherent propensity for reinvestment in any project, business or acquisition with a positive return. The greater good of debt is its discipline in forcing capital efficiency and reducing agency costs.[12]

Some have adopted a more elegant solution to the agency issue, institutionalising fiscal discipline and capital efficiency. EVA brings the discipline of debt, without the pain of covenants, by charging for all capital employed. An EVA management system can provide not only the discipline of debt, but also tools, skills and correct incentives. While EVA is no substitute for a sound business strategy, it can be used to evaluate and identify the best strategy, and, more importantly, to support strategy execution and operational excellence.[13]

Signalling

There are secondary issues that are not constraints so much as effects to be managed within the corporate financial strategy framework. The object of the most academic study has been that of the signalling effect said to arise from the information asymmetries between managers and investors. Distribution policy is construed as information laden, creating a self-reinforcing pattern that then signals the profitability expectations of insiders to outsiders. In a world of asymmetrical information, where insiders are believed to have superior knowledge with respect to the future prospects of the business, this signalling provides a market in knowledge regarding expectations for future performance.

"Bargain prices"

Beyond any effects of capital structure, agency issues and signalling, a share repurchase is an economic non-event *until* the share price stops trading at a discount to its intrinsic value. Total enterprise value and total equity value are each diminished by the amount of cash disgorged –

Table 5. "Bargain" impact to intrinsic value per share as a function of market discount and buyback size

Market/ intrinsic value ratio	% share buyback				
	5%	10%	15%	20%	25%
90%	1	1	2	3	4
85%	1	2	3	4	6
80%	1	3	4	**6**	**8**
75%	2	4	**6**	**8**	**11**
70%	2	**5**	**8**	**11**	**14**
65%	3	**6**	**10**	**13**	**18**
60%	4	**7**	**12**	**17**	**22**
55%	4	**9**	**14**	**20**	**27**
50%	**5**	**11**	**18**	**25**	**33**

shrinking the business, as if it has gone ex dividend. For every shareowner, the sum of the values of cash in hand plus the new ownership stake is *equal* to the value of the pre-deal ownership stake, net of taxes. This outcome is similar to the case where no repurchase is undertaken, and each shareowner participates fully in the upside appreciation of their ownership stake when the stock stops trading at a discount – but for one difference.

Because a business is smaller after a repurchase, its eventual appreciation in *percentage* terms is magnified if and when the stock approaches its "true" intrinsic value. The larger the repurchase, the larger the percentage gain. Therefore, the mathematics of percentages might provide a motive for repurchase. The general case as a function of both market/intrinsic value ratio and repurchase size is shown in Table 5.

The analysis in Table 5 provides the following practical observations.

- ❑ The gains from such an undertaking are not as substantive as one might expect, if none of the more traditional "theoretical" benefits of a repurchase is to be recognised.
- ❑ The "Bargain Price" motive for share repurchases is only material where the market price is at least 20% below the intrinsic value.
- ❑ A "Bargain Price" driven repurchase requires at least a 10% buyback for material impact.

Matching financial policy to business strategy

Financial policy can be considered to be largely driven by the enterprise's business strategy and operating plans, and this is well illustrated by the global beer industry example of Figure 1. In an otherwise low FGV industry, Anheuser-Busch (BUD) and Heineken (HINKY) stand out for their FGV premiums, implied in the 1998 year-end values. This is reinforced by their above-average price-to-earnings ratios.[14] Conversely, South African Breweries (SAB), Bass, and Brahma typify the industry's low future growth values and price-to-earnings ratios.

If the "today map" (Figure 4) is any indication of the strategies and expectations for future performance, then we can see a strong relationship between financial policy – in terms of financial leverage and dividend policies – and future growth value premiums. Valuation premiums are accorded to BUD, HINKY and Groupo Modello (GMOD), who earn

PANEL 3

SHARE REPURCHASE ALTERNATIVES

While open market repurchases are easiest to initiate, their greater flexibility and control comes at the cost of speed and commitment, weakening the signalling effect and slowing execution. Safe harbor provisions ensure a longer period to effect a recapitalisation. Fixed Price self-tender offers provide a more timely mechanism to recapitalise, and a stronger form of signalling than other forms of repurchase.[1] However, studies have also shown that higher premiums are typically paid in fixed price offers.[2] The "Dutch Auction" self-tender offer is an increasingly common method of quickly repurchasing a large portion of the company's stock, with a more efficient pricing mechanism. A significant premium must be offered to effect a successful tender, and insiders must commit not to participate in the tender.

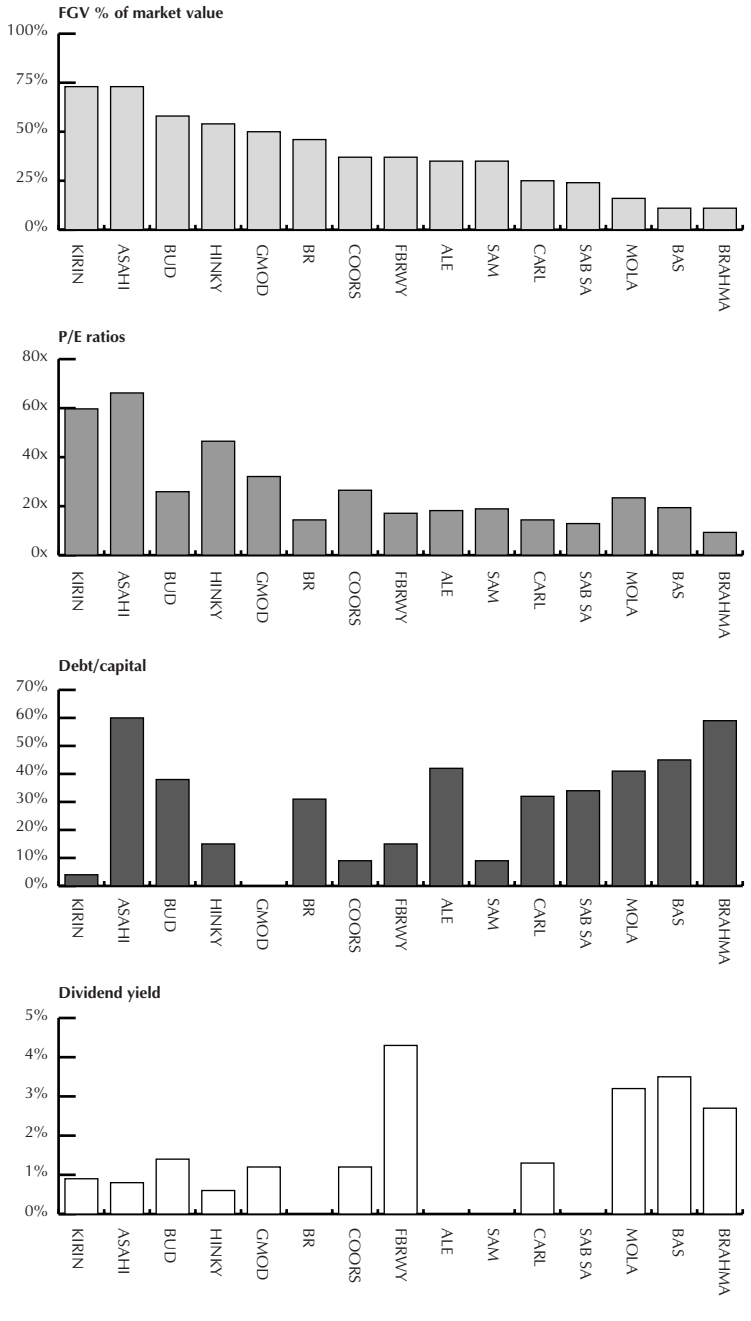
1 In a comparison of three forms of common share repurchases, fixed price self-tender offers were found to be the strongest signal of stock undervaluation, followed by the Dutch Auction. Open market share repurchases were found to be a relatively weak signal. The signal was found to be strongest when insider wealth was at risk – where management did not tender. Comment, R. and Jarrell, G.A., "The Relative Signalling Power of Dutch Auction and Fixed Price Self-Tender Offers and Open-Market Share Repurchases" *The Journal of Finance* XLVI(4), September 1991.

2 Self-tenders pay a substantial premium for tendered shares, Peterson, D.R. and Peterson, P.P., "Dutch Auction Versus Fixed-Price Self-Tender Offers: Do Firms Overpay in Fixed Price Offers?" *The Journal of Financial Research*, XVI(1), 1993.

healthy returns in excess of their cost of capital (driving COV, but carrying significant expectations for profitable growth) driving FGV. Presumably, the greater opportunities afforded require the financial flexibility derived from generally lower financial leverage and dividend yields. It would also seem that the risk of agency issues is lower for these proven industry leaders, reducing the need for higher leverage or higher dividends as a safeguard mechanism for shareholders.

There can be sound economic rationale to share buybacks, though these are not typically expressed in the case of many companies announcing such tactics. With so many firms employing or considering share buybacks, a value-based framework for relating financial strategy and tactics to economic performance and business strategy becomes increasingly important. Share repurchases can be a more tax efficient form of cash distribution than dividends. They can also enhance shareowner value through a combination of improved capital structure, reduced agency costs and signalling effects. While financial strategy is often interpreted narrowly as an exercise

4. Financial policy as it relates to future growth value (FGV)



in cost of capital minimisation, in practice, the determinants of financial policy must support enterprise value maximisation. While the firm's cost of capital and the resulting impact on firm value is an important element, financial strategy must also support the company's business strategy and consider financial flexibility, agency issues, flotation costs, signalling and clientele considerations.

CONCLUSION

The measurement and management of corporate (or enterprise) performance has received a glut of attention over this past decade – on the heels of the restructuring of the 1980s. But the 1990s has been a decade of remaking the public corporation from within – reforming governance and restructuring businesses, largely without the hostile external impetuses.

In the late 1990s, under the pressure of rising market expectations implicit in any long bull-market, companies face unprecedented demands for profitable, long-term growth. In most industries, and the market as a whole, market capitalisation is largely premised on profitable growth beyond the present value of all current operations – positive NPV investments that have yet to be discovered. In this environment, the value of intangible investments into organisational software – brands, processes, patents and intellectual capital – have become the most strategic investments an enterprise can contemplate. Financial policy must be updated and framed within the context of this new world – a financial policy consistent with, and supportive of, growth needs of business strategy, and the expectations of the market.

Growth options, flexibility and options to defer, have all become necessary tools to manage and exploit the value of uncertainty and volatility. The financial measures, tools and management systems of the modern corporation have had to keep pace with the more complex and rapidly changing business environment. Whether managing global growth options, or the options implicit in a new business bid, executives apply much more rigorous and sophisticated analytics. The key to their successful use will be the extent to which they can be simply applied and communicated.

1 The EVA framework is presented in more detail in *The Quest for Value*, Harper Collins, 1991 by Bennett Stewart. EVA© is a registered trademark of Stern Stewart & Co.

2 EVA thus attempts to resolve the agency issues identified by Michael C. Jensen in "The Agency Costs Of Free Cash Flow: Corporate Finance and Takeovers", *American Economic Review* (1986), 76(2), (May), who observed that "mature" companies often generate significant levels of free cash flow with a tendency to retain and waste this capital through over-investment and diversification schemes. Under EVA, the need to "service" the capital charge might partially alleviate a company's inherent propensity for reinvestment in any project, business or acquisition that may have a positive return, and is thus earnings accretive, but does not earn its cost of capita.

3 Sloan, A.P., 1996, *My Years with General Motors*, ed. McDonald, J. with Stevens, C. and P.F. Drucker (Introduction).

4 Scott, K., "The Role Of Corporate Governance In South Korean Economic Reform", *Journal of Applied Corporate Finance*, 10(4) Winter 1998. This entire issue highlights topics in international corporate governance. For a broader introduction to the subject, see also Monks, A.G., and Minow, N., *Corporate Governance*, 1995, Blackwell Business, or Chew, D.H., *Studies in International Corporate Finance & Governance Systems*, 1997 Oxford.

5 Romer, P., "Bank of America Roundtable – The Soft Revolution: Achieving Growth by Managing Intangibles", *Journal of Applied Corporate Finance*, Summer 1998.

6 See, for example, the roundtable discussion led by C.K. Prahlad of the University of Michigan, *Journal of Applied Corporate Finance*, Volume 12, Number 2 (Summer 1999).

7 See, for example, Baruch Lev and Theodore Sougiannis (1993), Bronwyn Hall (1994), Su Chan, John Martin & John Kensinger (1990, 1992), and George Pinches, V.K. Narayanan and Kathryn Kelm (1996).

8 To ensure that the initial investment did not dilute the business unit's EVA, the supplier adjusted the straight-line depreciation charge of US$100 MM (of the initial US$500 MM investment) and the associated EVA capital charge to a sinking fund depreciation (a mortgage payment function) approach.

9 See, for example, "Buyback Myopia", *Treasury and Risk Management*, July 1999.

10 See, for example, a discussion of the reasons for dividends in Bagwell, L.S. and Shoven, J.B., "Cash Distribution to Shareholders", *Journal of Economic Perspectives*, 3(3), Summer 1989.

11 For further discussion of practical issues in corporate financial strategy, see for example, the case of the first self-inflicted dividend cut by a healthy, major US utility in D. Soter, Brigham E. and Evanson P., "The Dividend Cut Heard Round The World: The Case Of FPL", *Journal of Applied Corporate Finance*, Spring 1996.

12 Debt creation, without retention of the proceeds of the issue, enables managers to effectively bond their promise to pay out future cash flows. Debt can therefore be an effective substitute for dividends, a fact not generally unrecognized in the literature. Jensen, M., "Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers", *American Economic Review*, 76(2), (May 1986).

13 A Stern Stewart & Co study of our own EVA clients found that they outperformed their industries by an average of 8.5%, compounded annually, for five years post-implementation, with outperformance in every year.

14 While Japanese beers Kirin and Asahi also exhibit higher premiums, their case is one of more a function of poor operating results than a premium valuation – essentially a smaller denominator, rather than a larger numerator. Thus, the future growth value implies a significant expectation of "improvement" due to the valuation floor.

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