A Study for the Introduction of EVA (Economic Value Added) as a Management Performance Evaluation System in Korea.

by

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Submitted to the Alfred P. Sloan of Management
in Partial Fulfillment of the Requirements for the Degree of

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Abstract

This thesis focuses on finding a proper management performance evaluation measure that is fit well for sustainable wealth creation for shareholders, right decision-making of Korean companies and describing some introduction procedure strategies that should be considered when a Korean company wants to adopt the above proper management performance evaluation measure.

To find a proper performance evaluation measure this thesis have reviewed and analyzed currently used performance measures in terms of explanation power for MVA(Market Value Added), theoretically the definitive performance measure of shareholders’ wealth creation. Through analyzing empirical studies and case, even if there are still several unanswered questions remained about EVA(Economic Value Added), EVA was selected practically the best performance measure due to its highest correlation with MVA amongst current performance measures and EVA adopting companies’ superiority in performance compared with non-EVA peer companies.

As a result, this thesis recommended Korean companies to adopt EVA as a management performance measure and motivation tool with well designed introduction strategies.

Thesis Supervisor : S.P. Kothari
Title : Gordon Y Billard Professor of Accounting and Finance
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Chapter 1. Introduction : Necessity for the Introduction of proper Management Performance Evaluation System in Korea

1) Background : Lessons from the current economic crisis

In late 1997 Korea was hit by a financial crisis marked by massive capital outflows, a sharp depreciation of the won and severe distress in the corporate and financial sectors. There were many reasons for the Korean economic crisis. These include the shortage of foreign currency reserves, the government’s faulty currency protection policy, and simultaneous economic crisis in many South Asian countries (economic contagion). In addition, an important reason lies in the private corporate sector’s misguided investment behavior. Specifically, high leverage, sales-oriented companies that were too confident in their investments for expansion without due consideration for the shareholders’ value creation, compounded the crisis.

During the developing stages of the Korean economy, companies especially big conglomerates known as Chabol, performed a crucial role in the economic development up to 80’s with their expansion strategy supported by the government through the banks. But unfortunately after progressing of the open market and globalization in Korea the above expansion strategies used in many big companies did not work well anymore. Notwithstanding the government also used the asset size and loan size when they ranked, supported and regulated companies until 90’s for economic policy purpose.
Furthermore business environments like wide spread founder ownership, weak shareholder right, premature stock market, no incentive system (equal salary for the equal careers employees) hinder the introduction of the proper management frameworks for maximizing shareholders’ wealth through maximizing the current market value of the company.

It aggravated Korean companies’ competitiveness gradually in the fierce world market. In addition, many Korean companies with old framework went bankrupt or suffered hard time to turnaround their performance after the economic crisis. With the remarkable recovery of the Korean economy, surviving big Korean companies they have now learned a lesson from the crisis that the management framework is important. Trying to find new management frameworks, specially performance measures, decision making tool and incentive systems for sustainable value creation and right decision-making should receive high priority.

2) Maturity of the business environment in Korea to introduce a new Management Performance Evaluation system

Together with the above mentioned companies’ need, by and large the business environment also has ripened under the IMF rescue loan situation to introduce a new framework. Because on the way to accept overflowing restructuring requirements from foreign creditors – of course those things based on their interests - including IMF, the Korean business atmosphere has radically changed. It is now getting close to the international standards which usually are set in the United States. The nature
of the standards is summarized below.

First, changes in corporate governance are conspicuous, starting with the outside directorship required by law, empowering the board, extension of the professional management position in the company have enhanced the transparency of the corporate governance and decision making.

Second, the respect for the minority shareholders’ right is accorded by a business law. As a result, management responsibility to minority shareholders has increased.

For example, performance, which affects the stock price and dividend, can be a indicator to evaluate the management. In the past, most management who was appointed by the major shareholders or major shareholder himself as a founder did not worry about the performance evaluation by the minority shareholder.

But, the improvement of minority shareholders’ rights ignited the recognition of shareholders’ wealth creation in decision making process to maintain his current position. Furthermore to decrease the high leverage, companies need to bolster their equities through rights offerings, which means management should pay attention to the stock market.

Third, the traditional employment relation between management and labors has collapsed.

No more life time employment is guaranteed, on the contrary variable incentive system studied to encourage the morale of the employees.

Finally and most importantly, Korean companies must observe international business standards, including those pertaining to accounting.
Practically there were many specific business customs in Korea. For instance, the cross guarantee among the big company subsidiaries, different accounting practices, government involvement, limitation to the foreign financial market and market regulation.

These are all obstacles to make correct evaluation on a certain company's management results, because it depend heavily on the accounting method, transfer pricing among the same conglomerate subsidiaries.

But adopting international standards made the business environment of Korea similar the business standard lead by the United States

3) **Objective of the thesis:** Study the reasonableness of EVA as a Performance measure in Korea through the analysis of EVA companies in the US.

Considering the current situation in Korea, company need and business environment change, this is the best time to study finding the right performance evaluation system for Korean companies.

Accordingly I suggest EVA(Economic Value Added) as a new management framework on the basis of evidence of positive performance results for various industry companies in United States after EVA introduction as their management framework and because the business environment in Korea has become similar to that of the United Stated after recent radical changes following the economic crisis.
In this context, I describe the rest of the thesis as follows.

I review the current competitive performance measures, then check the advantage of EVA among them through the comparison and analysis of currently performed empirical studies for EVA companies.

In addition, I include one non-US EVA company case which introduced EVA as a performance measure and compensation plan. Finally, in the practical perspective I study the successful EVA introduction and implementation procedure recommended for Korean companies.
Chapter 2. Review the current Performance measures

In this chapter I would like to review some currently used performance measures and analyze their advantage and disadvantage through the comparison. Finally select a proper candidate for the performance measure for Korean company, in-depth study for the superiority of certain selected measure will be followed by the next chapters.

1) Ideal characteristics of a performance measure

Before reviewing the currently used performance measures, I describe the desirable and ideal characteristics of a performance measure. It may helpful to select the proper candidate among them.

- Performance measure is tied logically and empirically to the creation of shareholder wealth, i.e., high stock prices.
- It always gives the “right” answer, in the sense that greater the performance measure the better it is for the shareholders unambiguously. This characteristic makes it the only genuine continuous improvement metric.
- The framework underlying a comprehensive new system of corporate finance that guides every decision making, from annual operating budgets to capital budgeting, strategic planning and acquisitions and divestitures etc.
- It should be a simple but effective in teaching business literacy to even the least sophisticated workers.
- To be used as an incentive compensation system simultaneously, it should truly
align the interests of manager with the those of shareholders and cause manager to think and act like owners.

- Companies can use it to communicate their goals and achievements so that investors can use it to identify companies with superior performance prospects.
- Most important, it motivates all managers and employees to work cooperatively and enthusiastically to achieve the very best performance possible as an internal system of corporate governance.

The performance measure that satisfies above criteria would be a proper performance measure and an integrated vehicle to guide evaluation of performance, compensation system and decision making tool at the same time.

2) Analysis of current performance measure

For analysis purpose I classify current performance measures as two group, one group is the accounting measures such as Net operating profit, ROE(Return on Equity), ROA(Return on Assets) or RONA(Return on Net Assets), EPS(Earning Per Share) which use accounting data without any modification , the other group is non-accounting measure like NPV(Net Present Value), Cash Flow, Market Price, EVA(Economic Value Added) which does not use accounting profit directly.

2-1) Accounting Measures

By and large performance measures that use accounting profit directly have some problems.
The first problem basically comes from what it called accounting anomalies. Conservatism, the fundamental idea in accounting, distorted accounting earnings through transitory and arbitrary items such as full expensing of research and development, asset write-off, restructuring charges and goodwill amortization. In this result the gap between accounting data by GAAP and economic reality have grown widely and the association between accounting data and market values has weaken more and more.

For example the GAAP require immediate charge off all spending on intangibles such as R&D and training expenses even though companies make those investments only because it expect a positive return in the future. And it also ask instant charge against earning for certain percent of the bad-debt losses on the new loan even though it is no more sense than immediately booking certain profit on the rest loans. These examples of accounting conservatism are originated from historically focus on financial statement preparation for lender. Lenders do not care much about profitability and performance but do care about whether they can get their hands on enough cash to recover their loans if a borrows goes bust. As a result balance sheet do not provide a measure of the cash that investors have put at risk a going concern. Instead it show the minimum amount that a liquidator could expect to get for the assets in a fire sale.

The security laws are another important contributor to the conservatism in accounting, they lead accountants to the side of debiting the earnings to avoid sued for fraud by overstating the earnings. So, they insist on companies amortize
goodwill instantly. In the end accounting data prepared by the GAAP are ill-suited to the business environment and fail to meet the need of managers and shareholders even though it serve well creditors in some sense.

For above reasons although some performance measures have some advantage as long as they use accounting data directly without any modification can not fit for performance measure. Accordingly net operating profit, ROE(Return on Equity), ROA(Return on Assets) or RONA(Return on Net Assets), EPS(Earning Per Share) have this significant weakness in the end as a performance measures.

Second problem is the linkage possibility to the compensation system. Considering the final purpose of the performance measure is the sustainable creation of shareholders wealth, compensation system which linked with performance measure through the well alignment is very important to make managers act like owners of the proportion of the business they influence most strongly and directly. Namely align decision with the right performance measure lead the manager to the shareholders wealth creation and it will be enforced by the compensation system linkage at the same time, then company can attain the ideal situation which performance evaluation system pursue.

Compensation plan typically should have four key objectives as below.

First, to align management and shareholder interests by giving managers the motivation to choose strategies and make operating decision that maximizes shareholders wealth.

Second, to provide sufficient leverage, as measured by the variability of potential
rewards, to motivate managers to work long hours, take risks, and make unpleasant decisions such as laying off staff or closing a plant.

Third, to limit retention risk or the risk that valued managers will bolt for a better offer, especially during the industry downturns and recession.

Fourth, to keep shareholders’ cost at a reasonable level.

In addition to the accounting anomalies, in the above contexts net operating profit, ROE(Return on Equity), ROA(Return on Assets) or RONA(Return on Net Assets), EPS(Earning Per Share) fail to meet the compensation plan’s objectives.

Assuming a certain company adopt net operating profit as a performance measure, in this case bonuses for business-unit managers are determined largely by the performance of the business unit itself, measured in net operating profits with some additional weighting for overall corporate results. The alignment in these plans is very feeble because the accounting profits due to its various permutations are not systematically linked to shareholder value. For example profits make no provision for the opportunity cost of equity capital and the effect of balance sheet management, as result some actions that increase accounting profits actually destroy the shareholder wealth.

Although ROE(Return on Equity), ROA(Return on Assets) take balance sheet into account, they are also distorted by the accounting anomalies, i.e., they are easily manipulated. Managers can boost their ROE simply issue bonds and repurchase stock so long as the return on assets exceed the after tax cost of debt. Furthermore, managers can also enhance their ROA simply turn down the investment proposal
which less than or close their target ROA even if they will return more than the cost of capital and would add to shareholder wealth.

EPS (Earning per share) can be also manipulated by accounting practices easily like net operating profits.

Above mentioned deficiency of accounting based measures make me check the some other measures which focus on the variables that drive the underlying economics of business directly to improve shareholder wealth.

2-2) Non - Accounting Measures

NPV (Net Present Value) which include the cash flow concept with its calculation analysis, have used by the many companies today to screen capital spending projects. This involves estimating the cash flows that a project will produce each year, discounting them back to the present at an interest rate equal to the cost of capital, and subtracting the cost of the project to obtain its net present value, i.e. NPV. The discounted cash flow approach is fine in principle. The problem using the discounted cash flow to estimate NPV is that once a project has been approved and the money spent, hardly anyone have check to see if the actual cash flows lived up to the projections. Instead the investment is treated in ongoing performance assessment as if capital is free, with the business unit judged only on the operating cash flows it generates. Namely NPV is a stock measure. It is not fit to the one purpose of the performance evaluation, compensation device which should be based on the flow measure. As a result although NPV give identical answers in valuing the
company like EVA it can not be used as a compensation system for period-by-period contemporaneously, but can be used as a general description of value on a decision-by-decision basis more properly.

Sometimes stock price, market value(market capitalization.), use as a performance evaluation measure. In some sense it would be a good measure considering it's simplicity, objectivity and plausible relation with the performance of the companies due to it's collective decision result in the market. But market value says nothings at all about wealth creation. It tells only current value of the a certain company, but it ignores the vital and important matter of how much capital the company invested to achieve that value. Wealth creation is determined not by the market value of the company but by the difference between market value and the capital that investors have committed to the company.

In this reason the market value should be gone from the would-be proper candidate for performance measure too.

From above analysis, I may conclude the difference between market value(both equity and debt) and total capital that investors and lenders have committed to the company – MVA, Market Value Added - would be the best as a performance measure that eliminate the suggested problem such as overall accounting anomalies, static measure, explanation capability for the wealth creation.

\[
MVA = \text{Market value} - \text{Total capital}
\]

MVA is the definitive measure of wealth creation. It can beats out all other measures
because it is the difference between cash in and cash out – between what investors put into a company as capital and what they could get out by selling a today’s market price. Accordingly MVA is the cumulative amount by which a company has enhanced or diminished shareholder wealth. And it also is the best external measure of the management performance because it capture the market’s assessment of the effectiveness with which a company’s managers have used the scarce resources under their control. Considering market value incorporate the present value of expected long-run payoffs and investor judgement risk as well as performance, MVA can reflects how well management has positioned the company in the long run and it is a automatically risk adjusted figure. This means MVA is a measure we can use it directly compare the performance of companies in different industries or even different countries. In addition the one with higher MVA has created more wealth. Most important, it is the ultimate goal in the wealth creation game

Then, why everyone doesn’t use it?

While the goal of every company should be to create as much MVA as possible, MVA itself is not much use as a guide to day-to-day decision making.

For one thing, change in the overall level of the stock market can overwhelm the contribution of management actions in the short run. Second, MVA can be calculated only if a company is publicly traded and has a market price. Third, even for public companies, MVA can be calculated only at the consolidated level; there is no MVA for a division, business unit, subsidiary, or product line. Thus, MVA provide no help in assessing the performance of the many pieces that make up
corporate whole. As a result, managers have to focus on some internal measure of performance that is closely linked to the external MVA verdict.

These practical problems can be overcome if there is practically calculable internal measure of performance which is closely linked to the ideal external MVA. As a result highly correlated, practically calculable internal measure would be the best performance measurement. According to the Stern Stewart, their empirical test using the performance 1000 database shows EVA statistically explain about 50% of the movement in company’s MVA and any other performance measures can not explain the change in MVA more than EVA. It means correlation between EVA and MVA is highest among the current performance measures. Because stock prices are highly depend on the expectations no performance measure can possibly correlate perfectly with changes in MVA. Below figure 2.1 shows Stern Stewart result. (figure 2.1) How the performance measures “explain” changes in MVA.
Some other researchers like James L. Grant of the Simmons Graduate School of Business, Kenneth Lehn, Anil K. Makhija also found a fact which support above Stern-Stewart's results.

With the assumption of EVA would be a best performance measure, I check the general advantage of EVA and implement the in-depth study for effectiveness of EVA through the comparison and analysis of currently performed empirical EVA studies for US EVA companies in next chapter to see if above mentioned research's reasonableness.
Chapter 3. EVA as a performance measure

1) What is EVA and it's general advantage

As we can see below EVA equation, EVA is net operating profit after tax and accounting adjustments minus an appropriate charge for the opportunity cost of all capital invested in an company.

\[
EVA = \text{Net operating Profits after tax (NOPAT) and accounting adjustments} \\
- \text{Capital charge}
\]

(Figure 2) Components of EVA

\[
EVA = \text{CFO} + \text{Accruals} + \text{ATInt} - \text{CapChg} + \text{AcctAdj}
\]
\[
= \text{Net Income (NI)} + \text{ATInt} - \text{CapChg} + \text{AcctAdj}
\]
\[
= \text{Net Operating Income after Tax (NOPAT)} - \text{CapChg} + \text{AcctAdj}
\]
\[
= \text{Residual Income} + \text{AcctAdj}
\]
\[
= \text{Economic Value Added (EVA)}
\]

CFO : cash flow from operation
Accruals : accruals introduced by the financial process
Net Income : net income before extraordinary items
ATInt : after tax interest
NOPAT : net operating profit after tax
CapChg : charge for the estimate current cost of debt and equity capital
AcctAdj : Stern Stewart's adjustments to NOPAT and capital for alleged accounting distortions (I will check detail contents in the chapter 5)
As such, EVA is an estimate of true "economic" profit, or the amount by which earnings exceed or fall short of the required minimum rate of return that shareholders and lenders could get by investing in other securities of comparable risk after adjustments of the accounting distortions.

EVA (Economic Value Added) is not only the performance measure that tries to capture the true economic profit of a company but also most directly is linked to the creation of shareholder wealth over time through the implementation of a complete EVA-based financial management system. Namely EVA-based financial management system as a decision making tool and incentive compensation system that gives managers superior motivation to make decisions that will create the greatest shareholder wealth in any publicly owned or private companies.

The first advantage of EVA comes from its consideration to capital charge. Which make managers pay attention to the Balance sheet - input side, equity cost - along with Income statement – out put side. Under conventional accounting, most companies appear profitable but many in fact are not because conventional Income Statement have not taken capital charge for equity into account as a expense.

As Peter Drucker put the matter in a Harvard Business Review article, "Until a business returns a profit that is greater than its cost of capital, it operates at a loss. Never mind that it pays taxes as if it had a genuine profit. The enterprise still returns less to the economy than it devours in resources until then it does not create wealth; it destroys it."

EVA corrects this error by explicitly recognizing that when managers employ capital
they must pay for it, just as if it were a wage.

By taking all capital costs into account, including the cost of equity, EVA shows the dollar amount of wealth a business has created or destroyed in each reporting period. For example, if the shareholders expect, say, a 12% return on their investment a year, they "make money" only to the extent that their share of after-tax operating profits exceeds 12% of equity capital. Everything before that is just building up to the minimum acceptable compensation for investing in a risky enterprise.

Second important advantage of EVA is that it aligns decision making with shareholder wealth. EVA helps manager incorporate two basic principles of finance into their decision making. The first is that the primary financial objective of any company should be to maximize the wealth of its shareholders. The second is that the value of a company depends on the extent to which investors expect future profits to exceed or fall short of the cost of capital.

By definition, a sustained increase in EVA will bring an increase in the market value of a company, as we see in chapter 2 – EVA has the highest explanation value for the change in MVA amongst currently used performance measures. This is because the level of EVA isn't what really matters. Current performance already is reflected in share prices. It is the continuous improvement in EVA that brings continuous increases in shareholder wealth. Namely EVA directly linked to decision making would enhance the shareholders wealth continuously.

Third advantage of EVA is conceptually simple and easy to explain to non-financial managers, since it starts with familiar operating profits and simply deducts a charge
for the capital invested in the company as a whole, in a business unit, or even in a single plant, office or assembly line.

By assessing a charge for using capital, EVA makes managers care about managing assets as well as income, and helps them properly assess the tradeoffs between the two. This broader, more complete view of the economics of a business can make dramatic differences.

Fourth advantage of using the EVA has made managers get out from the confusion in multiple goals in one company. EVA ends the confusion of multiple goals.

Most companies use a numbing array of measures to express financial goals and objectives. Strategic plans often are based on growth in revenues or market share. Companies may evaluate individual products or lines of business on the basis of gross margins or cash flow. Business units may be evaluated in terms of return on assets or against a budgeted profit level. Finance departments usually analyze capital investments in terms of net present value, but weigh prospective acquisitions against the likely contribution to earnings growth. And bonuses for line managers and business-unit heads typically are negotiated annually and are based on a profit plan. The result of the inconsistent standards, goals, and terminology usually is incohesive planning, operating strategy, and decision making.

EVA eliminates this confusion by using a single performance measure that links all decision making with a common focus: How do we improve EVA? EVA is the financial management system that provides a common language for employees across all operating and staff functions and allows all management decisions to be
modeled, monitored, communicated and compensated in a single and consistent way - always in terms of the value added to shareholder investment.

All above advantages of EVA charging capital cost, direct link to the decision making, conceptual simplicity, setting a single goal would fit for the ideal performance measure characters mentioned in the chapter 2 well. Furthermore we can use EVA as a bonus plan tool which finally change the behavior of the managers from agent(employee) to owner. That change may be a real key to shareholder value creation without stopping.

Accordingly if a company successfully introduce the EVA as a performance measure and linked it to the compensation plan, we can expect the improvement in EVA instantaneously. At the same time the company’s MVA and stock price at least increase relatively higher than other non- EVA peer companies in the same period.

I would check above preliminary conclusion in the next section. Whether it is statistically and empirically supproted or not through the analysis of currently performed studies.

2) Analyze the currently performed empirical researches regarding EVA and its effect on companies performance

After Stern Stewart’s EVA introduction in the mid 80s, there have been many studies on the usefulness of EVA. But although Stern Stewart published some
empirical articles, including Stern Stewart articles most of the studies have not been supported persuasive empirical studies due to the shortage of the available data on EVA for complicate statistical works, they highly depend on the each individual company case or fragmented data.

Then, many companies started to introduce EVA during the 1990s, accordingly end of the 1990s at last EVA researchers could access some data for their empirical studies. In this reason, up to now the empirical studies are on the way and their results are also various, i.e. some studies support EVA’s superior position among the performance measures and as an incentive system but the others deny the superiority of the EVA. Furthermore some researchers conclusion of the EVA is evolving due to their data and statistical methodology change.

At the moment usefulness of the EVA as an incentive tool and performance measure have been reached consensus among the researchers but the superiority of the EVA to explain the shareholder value change is still argued among the researchers.

In this context I divided current empirical studies into two group for comparison analysis ; pros side and cons side.

Pros sides include the Stern Stewart & Co. and independent researcher such as Stephen F. O’Byrne(Shareholder Value Advisor Co.) and Robert T. Kleiman(Oaklahoma University), Cons sides – all are independent researchers - contain Gary C. Biddle, Robert M. Bowen(University of Washington) and James S. Wallace(University of California at Irvine).
• **Pros of empirical study results.**

As an inventor of the EVA, Stern Stewart & Co. consistently has studied some back-up data for their EVA in the empirical side. Its beginning works were just showing the stock price increasing after EVA adoption as a performance measurement and incentive system in each company. We can find these kind of articles in many places up to 1995. For example in the Harvard Business Review Nov-Dec. 1995, Stern Stewart & Co. insisted EVA encourages managers to act like owners and boosts shareholders value by only three companies’ results after EVA adoption such as Equifax, Briggs & Stratton and Varity and by using positive comments of several companies’ CFO.

In the end 1996 Stern Stewart & Co.(O’Byrne) published “EVA and Market Value”(Journal of applied corporate finance, 96 spring volume 9 no. 1) based on the empirical study which used broad data and systematic method and approach. In this article they used nine years of data, covering the period 1985-1993, for the company in the 1993 Stern Stewart performance 1000. After excluding private company which did not traded in the market and extreme cases they used 6,551 company valuation years to find best performance measure which have highest explanatory power for market value.

According to the conclusion of the above article EVA, unlike NOPAT or other earnings measures like net income or earning per share, is systematically linked the market value. It provides a better predictor market value than other measures of operating performance. Especially they considered two important characteristics of
the market’s valuation of company, which did not considered and make previous research fail to find correct explanatory power of the EVA for the market value. First, investors capitalize positive EVA at much higher multiples than negative EVA. Which implies that multiples of positive EVA are significantly higher than multiple of negative EVA. Positive EVA is a sign of future EVA improvement because a growing company can create EVA improvement simply by maintaining its current rate of return. Lower multiples on negative EVA imply that the market expects a turnaround.

Second, capital multiples decline with size, which suggests that the market assigns higher multiples to given level of EVA smaller company. Big companies that don’t generate positive EVA now are less likely to generate any EVA improvement in the future.

Taking above two things into account in the regression enhanced the explanation power of EVA to market value almost 35%.(31% → 42%)

In addition, they also found that the earning model is really an EVA model through the mathematical form of the regression model. To having a “pure” earning model, the constant(intercept) part in the regression model should be zero, as a result the explanation power of the earning(NOPAT) drop from 33% to 17%.

In sum, after making a number of adjustments, they find that levels of EVA and its changes are significantly better predictors of current market values and changes than levels and change of NOPAT or FCF(free cash flows). The below figures summarize the findings.
(Figure 3) EVA and market value summary.

Recently Stern Stewart published what they called “The first comprehensive study of the stock market performance of companies”(Fortune March 29, 1999) that have adopted EVA with Stern Stewart guidance shows conclusively that they provide total shareholder returns that are substantially higher than those of their competitors. The study analyzed total returns to shareholders for up to five years from the month that companies began to implement EVA. On average, Stern Stewart EVA clients outperformed competitors of comparable market capitalization by 8.55 percentage points a year, or a total of 50.7 percentage points of total return over five years. Overall, the Stern Stewart clients created $79.6 billion more in market value than they would have had they performed the same as their competitors. And far from
being concentrated in a few outstanding firms, the out-performance is statistically robust across the entire data set at a 99 percent confidence level.

The study, conducted by Stern Stewart analysts, included 67 publicly owned U.S. clients for which at least 12 months of data were available. The only U.S. clients excluded from the study were those with less than 12 months of data, the small number of companies that decided not to adopt EVA after beginning their implementations, and ones that were acquired by other companies either before or shortly after they completed their EVA implementations. The acquired companies were excluded because their returns are biased upward by takeover premiums. The comparisons were with the median total returns of companies in the same four-digit SIC (the Standard Industrial Classification) codes as the EVA companies. (In a handful of cases, the analysts had to use three-digit SIC codes to obtain a sample of at least 10 competitors.) Since the starting date for each comparison is the month that a company began to implement EVA, the returns cover varying time periods, though most were within the 60 months ending in December 1998.

The relative performance of EVA companies was examined in several ways, including comparisons with broad market indexes. The method cited above - against the ten competitors that were closest in market capitalization - is the most appropriate because of an unusually strong, positive correlation between capitalization and stock market returns in recent years. In 1998, for example, the total return for the S&P 500 index was 28.6%, while the total return for the Wilshire 4500 index was only 8.6% and for the Russell 2000 index of mid- and small-cap
companies was minus 2.6%. For the five years ending in 1998, the S&P 500 had a total return of 24.1% a year, the Wilshire 4500 15.8% a year and the Russell 2000 just 11.9% a year. Because of these anomalous results, almost all companies look bad when compared. The changes in market capitalization are for the 1 to 5 year periods after each company in the study began to implement EVA and reflect dividends paid out over the periods. With larger rivals and shine when compared with smaller ones. The size advantage in recent years shows up clearly when EVA companies are compared with the median for all their competitors instead of those that are closest in market cap. Since expanding the universe brings in many smaller companies, the degree of superior performance jumps to 12.12 percentage points a year, or 77.2 percentage points over five years, and the percentage of EVA companies that outperform their competitors rises from two-thirds to three-quarters. Thus, the fairest comparison is with companies of comparable market capitalization, as they have reported in this study. It should not come as a surprise that companies using EVA framework for financial management and incentive compensation outperform their competitors.

First, EVA is tailored to eliminate economic distortions in generally accepted accounting principles, such as expensing research outlays or taking special restructuring charges for what really are investments in improved operating performance. Managers using EVA look beyond mere accounting numbers and base their decisions on real economic results. Second, EVA’s explicit charge against operating profits for the opportunity cost of invested capital allows managers to
assess how decisions affect the balance sheet as well as the income statement, and to accurately weigh the tradeoffs between the two. Third, Stern Stewart’s special EVA bonus plans are de-coupled from budgetary targets. By giving them an uncapped share of sustained EVA improvement, managers are strongly motivated to use the new tools at their disposal to achieve the very best results possible. Lastly, EVA permeates all aspects of managing and planning.

It provides a singular focus to align and speed decision-making, and to enhance communication and teamwork. Even so, the degree of out-performance found in the study is striking. Another striking aspect of the superior stock market performance is that it persists into the fourth and fifth years on EVA. On average, the EVA companies outperform their peers by 8.9 percentage points in the fourth year and 7.1 percentage points in the fifth year.

This suggests that the stock market did not fully anticipate the benefit of EVA, and continued to be “surprised” by superior operating results well after a company made the change. In a perfectly efficient market, all the future benefits of EVA would be reflected in stock prices immediately. Anecdotal evidence suggests that the market is catching on, however. The price of Federal-Mogul’s stock rose nearly 4% on May 22, 1997, when it announced it was adopting EVA, and the stock of Best Buy jumped 10% when it made a similar announcement on November 18, 1998. And shares of Genesco Corp. rose nearly 20% in the five trading days after its EVA announcement on April 6, 1999.

Below Figures are summary of above article’s results.
(Figure 3) EVA companies vs. Ten Closest in Market Cap; Total return to Shareholder

Another EVA supporting empirical study performed by Robert T. Kleiman, professor of Oakland University independently. He pointed out previous academic research results regarding performance measure were so mixed and plagued by methodological difficulties and control group selection mistakes.

To correct above problem his study select only those firms that have employed EVA as a EVA adoption company group, i.e. not contain RI(Residual Income) adopting companies at the same group. His study also concentrate on addressing the issue, “Do companies adopting EVA add more value for their industry competitors?”, with furnishing evidence of operating improvements that help explain such increases in shareholders value.
He chose 71 companies as the EVA adopting companies during the period of 1987-1996, then determined to use four-digits SIC code for finding industry peer group firm to each EVA firm. In this case he defined the “closest-matched peer firm” represents the company in the same four-digit SIC code which was closest in the sales to the EVA company in the year prior to the adoption. Sampled EVA companies are all use EVA as a performance measure and incentive purpose at the same time which may helpful to find clear relationship between EVA and stock market return.

One interesting thing is the composition of sample EVA companies. Manufacturing industry account for 48 out of 71 (or roughly two-thirds) of the sample companies, others consist of 9 transportation, 4 wholesale, 4 financial, 3 service, 2 retail trade and 1 construction. It may show the industry preference for EVA adoption.

With above samples his study compares total return – incorporate cash equivalent distributions along with price appreciation plus the reinvestment of dividends –to shareholders with those of companies in the same industries for two-, three-, four-year time horizons from the time companies began to adopt EVA. Abnormal returns were computed by subtracting the median figure for the peer group from the median of EVA firms.

In his study relative stock market performance is shown for two groups of peers, one is the closest matched peer and the other is the median peer, which is the median of all publicly traded U.S. companies in the same four digit SIC code excluding the EVA company. Below figures are results of his studies.
(Figure 4) Stock market performance of EVA adopting companies.
As we can see above figures his study constitute strong evidence that the stock market performance of EVA companies is significantly better that of industry competitors. When compounded four years after EVA adoption, EVA companies had 28.8% percentages($124bil.) points extra total return to shareholders versus the median industry competitors. Comparisons based on the closed-matched industry peer firm by sales show similarly strong result for the companies adopting EVA.(CAR(%)+ 7.8%, CAR($) $86bil.).

In addition, his study has also shown that companies that adopt EVA as the basis for the total management and incentive system benefit from an improvement in operating performance as measured by traditional financial ratios. In particular, operating profit margin before depreciation and operating income before depreciation per employee demonstrate material improvement vis-à-vis S&P 500 companies as a whole. While there is some decline in the number of full employees and capital spending, these changes are not statistically significant. There are, however, significant sales of property, plant and equipment.

Taken as a whole, his findings in analysis of changes in operating and financial ratios are consistent with actions aimed at increasing EVA. And, these actions are in turn consistent through the management behavior changes with the reported increase in the relative stock market performance of the EVA companies.

I think if above kinds of management decisions to increase EVA based on the four fundamental rule suggested by the financial theory then EVA has some sustainability to enhance shareholders value creation (Four fundamental rules ; Invest additional
capital in projects yielding higher than the total cost of capital required. Earn more profit without using more capital or cutting cost or increasing sales revenue through higher unit prices or volume, Use less capital and return the excess capital to shareholders through higher dividends or stock buybacks, Judiciously increase the level of financial leverage if the company has low business risk operating leverage

- **Cons of empirical study results.**

Gary C. Biddle, Robert M. Bowen, James S. Wallace (henceforth “BBW”) have consistently published their empirical study regarding performance measure. Among them I would like to refer their recent two articles, “Does EVA beat earnings? Evidence on associations with stock returns and firm values” (Journal of Accounting and Economics 24, 1997) “Evidence on EVA” (Journal of applied corporate Finance, volume 12, summer 1999), as a Con side study to EVA.

In 1997 article, BBW insisted that EVA do not dominate earnings in relative information content and suggest rather that earnings generally outperforms EVA in terms of explanation for firm value and stock returns. Moreover, BBW applied sufficient data (6,174 firm year observations for 773 firms) to find out association between performance measure and stock return with relative information content and for the first time they used each EVA component (see Figure 2, EVA = CFO + Accruals + ATInt – CapChg + AcctAdj) separately to test of incremental content of each EVA component.

In 1999, BBW handled “Evidence on EVA” comprehensively and independently
again. They categorized current arguments about EVA for two claims and 7 sub-questions then gave their own answers using 1997 article and some new study. The contents of two claims and 7 sub-questions are as follows.

**Claim#1 – EVA better explains stock returns and firm value**

Q1 : Do EVA and/or RI dominate earning(NI) and operating cash flow(CFO) in explaining contemporaneous stock returns?

Q2 : Do components unique to EVA or RI help explain contemporaneous stock returns beyond that explained by CFO and NI.?

Q3 : Does EVA dominate earnings in explaining firm value?

**Claim#2 – EVA better motivates managers to increase shareholder wealth**

Q4 : Does assets turnover increase for firms adopting residual income-based compensation plan(relative to non-adopter)?

Q5 : Do assets dispositions increase assets acquisition decrease for firms adopting residual income-based compensation plans(relative to non-adopters)?

Q6 : Do share repurchases and dividend pay-out increase for firm adopting residual income based compensation plans(relative to non-adopters)?

Q7 : Does residual income increase for firms adopting residual income based compensation plans(relative to non-adopters)?

Because 1999 article is a recent and contain the gist of 1997 article, I would focus on 1999 article to summarize BBW opinion follow above seven sub-questions one by one.

**Claim#1 – EVA better explains stock returns and firm value**
Q1: Do EVA and/or RI dominate earning (NI) and operating cash flow (CFO) in explaining contemporaneous stock returns?

As a test of association (goodness of fit) BBW use adjusted R-squared (Adj. $R^2$) from a regression of stock market returns on each performance metric. According to BBW’s result (Figure 5), current period accounting earnings (NI) is significantly more highly associated with market-adjusted annual stock returns (Adj. $R^2 = 12.8\%$) than are RI (Adj. $R^2 = 7.3\%$) and EVA (Adj. $R^2 = 6.5\%$), and that all three dominate cash flows from operations, CFO (Adj. $R^2 = 2.8\%$). This finding is supported across a number of alternative specifications. These results do not support the claim that EVA dominates earnings in its association with stock returns. On the contrary, NI appears to outperform EVA on average.

(Figure 5) Relative information content of EVA, residual income, accounting earnings and operating cash flow
Q2: Do components unique to EVA and/or RI help explain contemporaneous stock returns beyond that explained by CFO and NI?

To address this question, they decompose EVA into its component parts, i.e. cash from operations, operating accruals, capital charge and net accounting adjustments and evaluate the contribution of each component toward explaining contemporaneous stock returns.

(Figure 6) Associations between contemporaneous stock returns and EVA, RI, Accounting earnings and CFO

As we can see above Figure 6, BBW find that EVA components add little to the explanatory power of the regressions. Further, tests across alternative specifications indicate that, while traditional earnings components such as operating cash flow and
accruals are consistently significant, components unique to EVA - that is, the capital charge and accounting adjustments - are often not significant in explaining contemporaneous returns. These results suggest that EVA components contribute only marginally to the information already available to market participants in net income.

It combines comparisons of relative information content comparisons (Adj. $R^2$ s) from Q1 (which are shown as circle sizes in the figure), and comparisons of incremental information content comparisons (F-statistics) from Q2, shown as relative positioning or lack of overlap (with less overlap indicating more incremental information content). Overall, neither EVA nor RI appears to dominate NI in its association with stock market returns. Earnings(NI) have the largest relative information content (as indicated by the largest circle) and the overlap between circles is large suggesting that there is little incremental information content in EVA, RI and CFO beyond that contained in Earnings.

Q3: Does EVA dominate earnings in explaining firm values?

To address this question, they replicate and extend a study authored by former Stern Stewart vice-president Stephen O'Byrne that appeared in the Spring 1996 issue of Journal of applied corporate finance. O'Byrne first compares Adj. $R^2$ s from regressing firm value on EVA and earnings measured as NOPAT. He reports an Adj. $R^2$ s of 31% for the EVA regression and 33% for the NOPAT regression. Next, he adjusts the EVA regression by allowing separate coefficients for positive and
negative values of EVA. He also include the natural log of capital in an attempt to capture differences in the way the market values firms of different sizes and including 57 industry dummy variables in order to capture potential industry effects. When all of these adjustments are included, O'Byrne obtains a larger Adj. $R^2$ for the enhanced EVA regression (56%) than for NOPAT (33%). BBW point out that O'Byrne makes adjustments only to the EVA regression. When BBW “level the playing field” by applying the same adjustments to the NOPAT regression and also examine NI, EVA’s superiority disappears. The NI regression has a significantly higher association with firm value (Adj. $R^2 = 53\%$) than the EVA regression (Adj. $R^2 = 50\%$) and the NOPAT regression (Adj. $R^2 = 49\%$). The latter two are statistically indistinguishable. Thus, as with their stock returns tests, results do not support the contention that EVA outperforms earnings in explaining firm values. To the contrary, and in contrast to claims by Stern Stewart, BBW’s evidence suggests that earnings more often dominates EVA in value-relevance to market participants.

BBW gave some potential explanation to above results as follows.

If earnings already conveys essential economic news (e.g., unexpected revenues and costs) - and the market provides its own cost of capital estimate - there my be little left to glean from EVA and RI. It also is possible that, for the time period we studied, the market had yet to recognize valuable incremental information contained in EVA and RI numbers. Accordingly, I think BBW did not completely deny the EVA as a potential performance measure.
Claim#2 – EVA better motivates managers to increase shareholder wealth

A second principal claim is that EVA or residual income-based incentive schemes are better than earnings-based plans in motivating managers to create shareholder wealth. In a recently published paper, "Adopting Residual-Income-Based Compensation Plans: Do You Get What You Pay For?" (Journal of Accountings and Economics 24, 1997), James S. Wallace provides independent evidence on this second set of claims and BBW agree with his study. Wallace found that managers change their operating, investing and financing decisions in response to RI or EVA incentives. Namely, RI or EVA based incentive compensation plans are effective in altering management decisions. As a result we can expect EVA-based incentive system probably increase firm value in the long run. Let’s first summarize three(Q4~Q6) research question results regarding claim #2 in Figure 7 then check detail contents later.

(Figure 7) Incentive effects following adoption of RI(or EVA) compensation plan
Q4: Does assets turnover increase for firms adopting residual income-based compensation plan (relative to non-adopter)?

As shown in Figure 7, total asset turnover increased by an average of 14 percent for firms adopting residual income relative to control firms in the period subsequent to adoption. This increase is statistically significant at conventional levels. Investing decisions also boost RI to the extent they re-allocate capital away from activities that earn less than their capital costs and toward activities that earn more. If the adoption of a RI-based compensation plan simultaneously introduces greater awareness of the higher hurdle rate for investments (now explicit in the full weighted average cost of capital, WACC), other things equal we should observe increased asset divestitures and decreased new investments.

Q5: Do asset dispositions increase and asset acquisitions decrease for firms adopting residual income-based compensation plans (relative to non-adopters)?

As depicted in (Figure 7), asset dispositions increased 100 percent and new investment decreased 21 percent after adoption (compared to pre-adoption levels) for the RI firms relative to the control firms. It is important to note that each of these results is driven by actions in the post-adoption period. In fact, the residual income adopting firms actually were investing more relative to the control firms in the pre-adoption period. Each of these changes is significant at conventional levels. However, it is difficult to interpret whether an observed reduction in net investment is a value-increasing action since it is possible that managers are reducing positive
NPV projects - not just projects earning below their cost of capital. Critics of RI-based compensation plans claim that they provide incentives for managers to under-invest in positive NPV projects. Proponents and users of RI-based incentives claim otherwise and in fact, argue that RI encourages investments that increase shareholder wealth.

**Q6: Do share repurchases and dividend payouts increase for firms adopting residual income-based compensation plans (relative to non-adopters)?**

As shown in Figure 7, both repurchases per share and dividends per share increase in the post-adoption period relative to the pre-adoption period. Relative to the matched-pair control firms, RI adopters on average dramatically increased repurchases per share ($1.09 or 112%) but only slightly increased dividends per share ($0.13 or 1%). Only repurchases per share are significant at conventional levels. These findings suggest that managers faced with higher investment hurdle rates under RI return excess capital to shareholders in a tax-favored manner that does not signal a permanent change in dividend payout. Finally, if managers take actions consistent with RI incentives, firms that adopt RI incentives should produce increased residual income.

**Q7: Does residual income increase for firms adopting residual income-based compensation plans (relative to non-adopters)?**

Here the evidence reveals that following adoption of RI-based incentive plans, the
RI firms relative to the control firms increased residual income by a statistically significant average of nearly $190 million annually (almost 1300%). This result is consistent with the adage that you get what you measure and reward. Although these results suggest that the adoption of residual income based incentives alter management decisions in ways that should contribute to shareholder wealth, several caveats are in order. First, firms that adopt new incentive plans may simultaneously change other aspects of their operations that also could influence management decisions (e.g., management realignments, strategic repositionings, restructurings, etc.). Thus, observed changes in management behavior could be due at least in part to these other effects. Second, BBW's sample is not random since firms choose voluntarily to adopt residual income-based plans. It could be, for example, that managers opt for residual income based compensation when they forecast success unrelated to the incentives in the plan. Finally, BBW concluded that one should be careful not to interpret these results strictly as confirming shareholder value creation. While they suggest changes in management behaviors that are consistent with RI incentives, it remains for future research to confirm that resulting benefits have been realized by shareholders.

In summary, BBW suggest their answers for the above two claims.

Regarding the first claim that EVA is more closely associated with stock returns and firm value than is net income, their answer is that EVA does not dominate traditional accounting earnings in associations with stock returns and firm values. On the
contrary, their evidence suggests that earnings generally beats EVA in value relevance to market participants.

They also provide possible explanation for above results as follows. Stern Stewart’s adjustments of GAAP earnings are already contained in earnings, EVA and RI contain little news beyond that already conveyed by earnings, market participants may apply different adjustments than those provided by Stern Stewart and market participants had yet to recognize the information contained in EVA and residual income. But these possible explanations can not be a critical reason to defeat their answer.

Regarding the second claim that EVA and residual income better motivate managers to increase shareholder wealth, their evidence suggests (see Figure 7) that firms that adopt residual income-based incentives tend to 1) improve operating efficiency by increasing asset turnover, 2) dispose of selected assets and reduce new investment (which adds value provided these assets were failing to earn adequate returns when compared to the firm’s overall cost of capital), 3) repurchase more shares (consistent with distributing underperforming capital to shareholders), and 4) Firms that adopt RI incentive plans also exhibit increased residual income.

These findings support a pre-condition for shareholder wealth creation by confirming that managers respond to residual income-based incentives. But, although BBW agree with the possibility that residual income-based incentives can motivate managers to take actions consistent with shareholder wealth creation, they do not believe this useful internal incentive measure, EVA or RI, to be a best role in
increasing share price at the same time. As a result, they used separable view to the claim 1 and 2 to explain discrepancy on their empirical results regarding claim 1 and 2 referring Jerold Zimmerman’s comment; “The success of a given performance measure in tracking near-term changes in a company’s stock price is unlikely to be the most important consideration in choosing a measure as a basis for managerial rewards...And the best performance measure is the one that, without imposing excessive costs, gives managers the strongest incentives to take actions that increase firm value.”

Therefore, They insist EVA and residual income could prove effective in motivating shareholder wealth creation without being informative to investors, and claims linking the two should be interpreted with care.
3) Summary : EVA and its critics.

Considering above two side empirical study results, I think both have almost agreed to the claim #2 "EVA better motivates managers to increase shareholder wealth (through EVA increasing)", however, still big differences exist between them regarding the claim #1 "EVA better explains stock returns and firm value".

I wonder why two sides empirical result had different in claim #1 despite of using similar original data pool provided Stern Stewart & Co and almost agreeing to the claim #2.

In this context, I have examined reasons to address above questions and found several clues as follows.

At first, I would point out the problem related to sample selection. To find out more accurate relation between EVA as a performance measure and stock market return, correct sample selection is the most important. Accordingly, we would better discern Residual Income concept with EVA and exclude Residual Income based incentive companies from EVA companies in sampling. In addition, EVA sample companies should also implement EVA-based incentive compensation system.

This effort have an effect to increase explanation power of EVA to stock market return and firm value. In this point I agree with Robert T. Kleiman’s sampling methodology in sample selection in his 1999 article (Some new evidence on EVA companies, Journal of applied corporate finance).

Secondly, I completely agree with the opinions that expressed by Stephen F.
O’Byrne (EVA and its critics, Journal of applied corporate finance, summer 1999) even if he was a Stern Stewart & Co.’s management in the past time. As he directed in his article BBW’s earnings variable is not a pure earning measure as long as its regression has non-zero intercept (in case of non-zero, capital still contribute the explanation power of earnings for stock market: regression equation, Market value = a×capital + b×earning(NOPAT)) and if we give “zero” intercept to the regression equation, explanation power of earnings to the stock market drop from original 33% to 17% compared to 31% of EVA (after adjustment 56%).

In particular, he proved “Why earning model is really an EVA model” through using a basic algebra for the regression model.

BBW’s regression analysis shows that investors put great weight on the cost of debt, while apparently ignoring the cost of equity. In this sense, their earnings variable is not a pure earning measure that exclude all financing costs but rather a hybrid earning measure that include interest costs.

Thirdly, I want focus on the agreement of the usefulness of EVA as an incentive system in both side. Although separable view has some sense in performance measure between stock price and incentive system, I think and BBW also described in its 1999 article (“Evidence on EVA”, Journal of applied corporate Finance, volume 12, summer 1999), ultimately if an internal metric or compensation plan has more effective in motivating shareholder wealth creation. Finally shareholders have benefit regardless of its correlation with stock returns and firm values. Namely, if EVA implemented successfully as an incentive performance measure in a company,
after all it contributes the wealth creation of its shareholders in the stock market.

Even if, there are still some unanswered questions remained regarding EVA companies performances in US, considering current empirical study results and above summary, I think EVA is worthy of attention by Korean companies to enhance motivation of the employee and shareholder’s value.

In this context, I would like to review the non-US EVA adopting company case in the next chapter to see if EVA’s usefulness in the foreign company and then describe some matters regarding introduction EVA to Korean companies such as introduction procedures, tailored EVA concept(accounting adjustments), proper industry.
Chapter 4. Foreign EVA adopting company case: Siemens A.G.

1) Siemens and a general information about EVA introduction

Siemens, which has headquarters in Berlin and Munich, is undeniably one of a global powerhouse in electrical engineering and electronics. They have more than 440,000 employees around the world working to develop and manufacture leading-edge products, design and install complex systems and projects, and tailor a range of individualized services as varied as their customers' requirements. The company operates some 500 production facilities in over 50 countries and meet their business and technical innovative solutions, offered by their Energy, Industry, Information and Communications, Health Care, Transportation, Lighting and Components segments as well as their Financing and Real Estate activities help improve living standards around the globe.

With business success, their foremost priority is to create value for their customers, shareholders and employees. For this reason, they decided to adopt a new value based measure of performance, EVA in October 1, 1997 under the its motto, “Clear Goals, Concrete Measures, Rigorous Consequences”, that became the obligatory performance measure within the entire Siemens organization on October 1, 1998. New management yardstick EVA introduction has resulted in significant improvements in productivity, innovation and growth. Purpose of EVA introduction is to achieve world-class status in all the Groups and a sustainable improvement in company value. The financial measure of improvement is "economic value added"
(EVA), the difference between net operating profit and the capital charge (8~11%) for business assets. The company's clear goal is to achieve a positive EVA for the entire company by fiscal 2001. Benchmarking and balanced scorecard to be introduced. The entire company is involved: every business unit has its own individual EVA goal and its success will be measured by its contribution to increasing company value. EVA goals are defined by business type and are monitored by regular benchmarking. By the end of 2000 fiscal year, 70 percent of their divisions will have completed a benchmarking project. Balanced scorecards are being introduced so that the whole process can be guided and controlled more efficiently. For implementing EVA measures in the areas of productivity, innovation and growth, proven management tools have been selected. The most important of these tools include portfolio optimization, asset management, increasing sales and cost cutting. Further levers are quality, innovation, and setting up new businesses. Each business will determine the specific measures to be taken in its own particular case. How it implements these measures will depend upon its goals and initial situation. The EVA measures worked out will be detailed and business-specific. The prerequisites for their realization will likewise be specified. Specific individuals will be made responsible for successful implementation which will be further supported by in-house "best-practice sharing" campaigns - sharing experience and know-how within the company. The effectiveness of EVA measures taken and the extent to which they have been implemented will be continually monitored to reveal both successes and failures. Progress will be checked by the Managing Board every
quarter in the presence of all Group Presidents. Consequences for operations and the personal development and income of those with business responsibility will be performance-based. The compensation system for senior management was changed on October 1, 1998. Now, only 40-60 percent of the salary of senior management is guaranteed. The rest is tied to the attainment of EVA goals. Stock options have also been introduced. This flexible compensation system is to be extended to more company employees in the next few years.

2) EVA Performance in 1999: including comparison with competitors
During fiscal 1999, Siemens continued to drive its entire management system enterprise-wide to focus on Economic Value Added (EVA). Basically, EVA is defined as net operating profit after taxes (NOPAT) minus capital cost, which represents the return minimum on the capital employed. According to this concept, a business creates value only when it recovers its cost of capital and furthermore fulfills the expectations of capital markets regarding EVA improvements. Because the three major components of Siemens: Operations, Financing and Real Estate, and Pension Fund, are fundamentally different from each other, they adjust their calculations of EVA for each one. This enables them to use EVA as a consistent management metric while leaving business-specific value drivers transparent. The EVA for Siemens worldwide is the sum of the EVA for the three components.

- EVA for Operations
For operating units, the basis for calculating net operating profit is EBIT (earnings before interest and taxes). Siemens calculate net operating profit after taxes (NOPAT) before financing costs in order to remove pure financing decisions from calculations of EVA performance. This allows Siemens to optimize equity and liquidity across the operating Groups based on prevailing tax and risk profiles, without affecting business performance measurement. For EVA purposes, the EBIT amount for each operating Group is adjusted to include certain financial transactions and to reflect a standard tax rate, currently 35%. Siemens determine capital cost using net operating assets, which consist essentially of their balance sheet assets less advances received from customers and liabilities that normally bear no interest. The term net operating assets equates to net capital employed except for the financial adjustments reflected in the net operating assets and the fact that Siemens compute net operating assets for the year as the average of four fiscal quarters. Capital cost of Operations is determined as the weighted average of the equity and debt capital cost rates after taxes. Currently the capital cost rates for their operating Groups vary between 8% to 11%, based on business-specific risk, which Siemens calculate for their operating Groups using available market data on their publicly traded competitors. Along with measures that are directly relevant to value-based management, such as EBIT and net capital employed, their segment reporting also discloses depreciation and write-downs for the fiscal year. In line with international practice, Siemens have adjusted their definition of depreciation and write-downs to include write-downs on long-term financial assets and non-current marketable
securities as well as amortization of goodwill. As a result, investors can now analyze Siemens' operating Groups for their earnings before interest, taxes, depreciation and amortization (EBITDA). This measure is gaining wider acceptance, particularly in the rapidly converging information and communication industries, where companies aggregate substantial amounts of goodwill through numerous acquisitions. In these cases, EBIT may be strongly affected by amortization of goodwill. In contrast, EBITDA bears a closer relationship to cash flow, which is increasingly used in company and stock market valuations.

- **EVA for Financing and Real Estate**

Siemens' Financing and Real Estate segment plays three important roles: providing efficient customer financing; acting as Siemens' internal treasury; and managing an international real estate portfolio. EVA calculation for this component is comparable to a measure used in the banking industry: return on risk-adjusted capital (RORAC). In this approach, higher-risk projects and assets require more underlying equity than those with lower risk. In calculating capital costs for Siemens Financial Services (SFS) and Siemens Real Estate Management (SIM), Siemens therefore carefully assess the business volume and risk profile of their various activities. The calculation of NOPAT for Financing and Real Estate is based on net income before taxes. Because interest cost is directly reflected in net income before income taxes, rather than captured indirectly through an overall capital cost rate, Siemens' calculation of NOPAT already includes interest costs before application of a
standardized tax rate, currently 35%. Because the requirements of debt investors are already included in net income, the capital cost rates of Siemens Financial Services (SFS) and Siemens Real Estate Management (SIM) reflect only the requirements of equity investors (that is, their cost of equity). Currently the capital cost rate is 9.75% for SFS, equivalent to a pretax rate of 15%. For SIM, the capital cost rate is 8.0%, equivalent to a pretax rate of 12.3%.

- **EVA for Pension Fund**

  Siemens’ goal for the Pension Fund is not to achieve a high EVA but rather to maximize the return on pension assets so as to cover their pension costs. Siemens Kapitalanlagegesellschaft (SKAG) administers their domestic pension fund assets and accruals as if they belonged to an external fund. Retirement benefit obligations for their employees abroad are primarily covered through external pension funds. The Pension Fund’s NOPAT calculation mainly reflects the interest cost on benefit accruals and the return on plan assets. Contributions to the pension accruals related to service costs are charged to Siemens’ operating Groups, who treat the benefits earned by their employees during the fiscal year as part of their functional costs. As is typical with off-balance-sheet pension funds, we allocate no equity capital to fund activities.

- **EVA in 1999**

  We can see as below, in fiscal 1999, Siemens made good progress in EVA goal.
<table>
<thead>
<tr>
<th>EVA calculation (in Mil. Of DM)</th>
<th>1999</th>
<th>1998</th>
<th>Inc(Dec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EBIT</td>
<td>5,810</td>
<td>3,198</td>
<td>2,612</td>
</tr>
<tr>
<td>Taxes and other</td>
<td>-2,024</td>
<td>-1,045</td>
<td>-979</td>
</tr>
<tr>
<td>Net operating profit after the tax</td>
<td>3,786</td>
<td>2,153</td>
<td>1,633</td>
</tr>
<tr>
<td>Net capital employed</td>
<td>53,360</td>
<td>49,874</td>
<td>3,486</td>
</tr>
<tr>
<td>Average calculation and other</td>
<td>-45</td>
<td>-4,812</td>
<td>4,767</td>
</tr>
<tr>
<td>Average net operating assets</td>
<td>53,315</td>
<td>45,062</td>
<td>8,253</td>
</tr>
<tr>
<td>Capital cost</td>
<td>-5,017</td>
<td>-4,279</td>
<td>-738</td>
</tr>
<tr>
<td>EVA for Operation</td>
<td>-1,231</td>
<td>-2,126</td>
<td>895</td>
</tr>
<tr>
<td>Financing and Real Estate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income from ordinary activities before taxes</td>
<td>358</td>
<td>413</td>
<td>-55</td>
</tr>
<tr>
<td>Taxes and other</td>
<td>-130</td>
<td>-127</td>
<td>-3</td>
</tr>
<tr>
<td>Net operating profit after the tax</td>
<td>228</td>
<td>286</td>
<td>-58</td>
</tr>
<tr>
<td>Equity</td>
<td>3,550</td>
<td>3,550</td>
<td>0</td>
</tr>
<tr>
<td>Capital cost</td>
<td>-315</td>
<td>-315</td>
<td>0</td>
</tr>
<tr>
<td>EVA for Financing and Real Estate</td>
<td>-87</td>
<td>-29</td>
<td>-58</td>
</tr>
<tr>
<td>Pension Fund</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income from ordinary activities before taxes</td>
<td>48</td>
<td>-9</td>
<td>57</td>
</tr>
<tr>
<td>Taxes and other</td>
<td>-17</td>
<td>3</td>
<td>-20</td>
</tr>
<tr>
<td>Net operating profit after the tax</td>
<td>31</td>
<td>6</td>
<td>25</td>
</tr>
<tr>
<td>EVA for Pension Fund</td>
<td>31</td>
<td>6</td>
<td>25</td>
</tr>
<tr>
<td>Siemens Worldwide EVA</td>
<td>-1,287</td>
<td>-2,149</td>
<td>862</td>
</tr>
</tbody>
</table>

EVA in Operations improved DM895 million, to a negative DM1,231 million, on strong positive earnings growth. Strategic acquisitions raised the amount of net capital employed in Operations, which in turn increased the cost of capital and exerted a negative effect on EVA for the year. Siemens expect that this effect will be
substantially offset by the long-term positive impact of the acquisitions on their future growth.

EVA in Financing and Real Estate declined to a negative DM87 million, primarily due to lower earnings at Siemens Financial Services (SFS). In the normal course of business, Siemens expect SFS and SIM to earn at least their capital cost like every other Siemens Group.

Pension Fund contributed DM31 million to their EVA improvement for the year. In total Siemens improved EVA for the year by DM862 million, to a negative DM1,287 million. To accelerate their progress in improving EVA, Siemens continue to benchmark all businesses against their top competitors worldwide, while binding their management compensation directly to our EVA development.

- **Comparisons with worldwide competitors**

As we can see below (Figure 8) Performance comparison, Siemens has shown superiority in sales growth, net income growth and stock price increase compared to its competitors such as GE, Hitachi, ABB in 1999 that was the first year for Siemens adopting EVA as a performance measure and compensation metric.

Specially, net income growth and stock price increase in Siemens were conspicuous relatively. Namely, efficiency in asset utilization and positive reaction from stock market to the EVA adoption have made above results. Accordingly, although Siemens EVA is improving but still negative, we could conclude that its performance will consistently enhance in the future due to its EVA management.
(Figure 8) Performance comparison in 1999 with world-wide competitors
Chapter 5. How to introduce EVA to Korean company

Based on the previous chapters’ study results I would recommend EVA as a performance measure for incentive plan and decision making tool for Korean companies. In this context, I will describe some useful matters for introducing EVA into Korean companies such as EVA introduction procedure strategy, accounting data adjustments for tailored EVA concept that reflect on different economic environment. In addition, I take into account lessons from early EVA adopted companies in the United States.

Before doing this I have summarized some specific features in Korean companies as below, which should be prudently considered for successful implementation of EVA in Korean companies.

- Despite of reconstruction efforts in corporate governance, there are still strong influence on the decision making process from owner.

- Basically Korean companies have highly centralized organization in terms of decision making and accountability.

- Many Korean companies had some experience suffering from over-investment, over-production, feed the dogs and starved stars due to conglomerate management style.

- Employees including managers have not accustomed yet to the performance evaluation and incentive plan for individuals.

- Due to unstable stock market makes some difficult to find out reasonable cost of
equity capital

- It is very probable to take relatively more time than we expect to set up EVA financial system because of deficiency of experience EVA consultants in Korea.

1) EVA introduction procedure strategy

According to EVA adopting companies, in doing to set up EVA introduction procedure strategy they usually used 3 phase approach as follows.

1-1) The first phase is a definition of measure and set up EVA management system

Translating accounting profits into economic reality, i.e. calculating EVA, we first make a number of adjustments to conventional earnings in order to eliminate accounting anomalies and bring them closer to true economic results. For example, GAAP requires companies to expense research and development outlays even though those expenditures are investments in future products or processes. In contrast, EVA capitalizes R&D spending and amortizes it over an appropriate period. Previous EVA adopting firms make similar adjustments to the balance sheet to get a more accurate capital charges (detail accounting adjustment will be described in next section). For example, Stern Stewart has identified more than 160 potential adjustments in GAAP earnings and balance sheets in areas such as inventory costing, depreciation, bad debt reserves, restructuring charges, and amortization of goodwill. However, in balancing simplicity with precision, they advise most clients to make
only five to fifteen adjustments. In customizing EVA to each client's specific situation, they help identify those adjustments that can meaningfully improve accuracy and, in turn, performance. The basic tests are that the change is material, that the data are readily available, that the change is simple to communicate to non-financial managers, and, most important, that making the change can affect decisions in a positive, cost-effective way.

While simply measuring EVA can give companies a better focus on how they are performing, its true value comes in using it as the foundation for a comprehensive financial management system that encompasses all the policies, procedures, methods and measures that guide operations and strategy. In this context EVA system should covers the full range of managerial decisions, including strategic planning, allocating capital, pricing acquisitions or divestitures, setting annual goals-even day-to-day operating decisions. In all cases, the goal of increasing EVA is paramount.

1-2) **Second Phase is a Motivation phase through linking EVA with incentive plan**

To instill both the sense of urgency and the long-term perspective of an owner, cash bonus plans that cause managers to think like and act like owners because they are paid like owners. Indeed, basing incentive compensation on improvements in EVA is the source of the greatest power in the EVA system. Under an EVA bonus plan, the only way managers can make more money for themselves is by creating even greater value for shareholders. This makes it possible to have bonus plans with no
upside limits. In fact, under EVA the greater the bonus for managers, the happier shareholders will be. Most managers today have incentive compensation plans that put too much emphasis on compensation and too little on incentive. Bonuses, whether meager or lavish, are earned by beating annually negotiated budgets. Under this system, a manager's greatest incentive is to negotiate an easily achievable budget and, because the bonus is capped, not to exceed it by too much for fear of raising expectations or damaging his or her credibility. EVA bonus targets, in contrast, are automatically reset each year by formula. If EVA shoots up, for example, next year's bonus will be based on improvement above the new, higher level of EVA. "Banking" a portion of extraordinary bonuses and paying them out over several years. Bonus banks make it possible to have "negative" bonuses when EVA drops sharply, and insure that bonuses are paid only for sustainable increases in EVA. With an unlimited upside and a bonus that is decoupled from the annual budget, EVA managers are motivated to go for home runs instead of settling for singles, and to make investments with long-run payoffs. The EVA result is annual budgets that are driven by aggressive strategy instead of strategy that is constrained by modest budgets.

1-3) Last phase implants EVA as a Mindset with important constituencies inside and outside of the company

When implemented in its totality, the EVA financial management and incentive compensation system transforms a corporate culture. By putting all financial and
operating functions on the same basis, the EVA system effectively provides a common language for employees across all corporate functions. EVA facilitates communication and cooperation among divisions and departments, it links strategic planning with the operating divisions, and it eliminates much of the mistrust that typically exists between operations and finance. The EVA framework is, in effect, a system of internal corporate governance that automatically guides all managers and employees and propels them to work for the best interests of the owners. The EVA system also facilitates decentralized decision making because it holds managers responsible for and rewards them for delivering value. A key to wiring EVA into the corporate culture is to make it the focal point for reporting, planning and decision making.

Above procedures take from 6 months to several years depend on company size, culture and infrastructures. For example, middle-market companies (fewer lines of business and a sharper focus than the Fortune 500) EVA implementation engagements involve a five-step process that typically requires five to eight months to complete follows:

1. Introduce EVA to management and the board of directors
2. Establish EVA centers, define EVA and provide EVA training
3. Develop the EVA financial management and reporting system
4. Refocus and strengthen incentives
5. Train line managers
Korean companies also should follow above procedures. Practical perspective, I think Korean companies take cautious for implementing EVA quick and decisive with owner(top management)'s strong commitment, setting up optimal structure of the EVA center, avoiding uncooperative behavior in the organization, decentralizing ownership accountability, transfer pricing, EVA measure through accounting adjustments and tailoring EVA for the special incentive plan that make manager into owner.

Furthermore, during the procedures Korean companies should pay attention to avoid below errors.

- The performance measures are too blunt and are not systematically related to shareholder value.
- Targets are often set through a counter-productive negotiation process that encourages managers to understate and under-perform their business 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.
- Financial measures and incentive compensation plans that are not linked to the operating and strategic levers by which managers can affect performance

2) Accounting data adjustments and tailoring EVA

To cure accounting anomalies or distortions mentioned in chapter 2, EVA adopting
companies use following typical adjustments.

(Figure 8) Examples of typical adjustments for alleged accounting distortions

<table>
<thead>
<tr>
<th>Common Areas</th>
<th>GAAP</th>
<th>Nature of adjustments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marketing and R&amp;D costs</td>
<td>Expense</td>
<td>Record as asset and amortize</td>
</tr>
<tr>
<td>Deferred taxes</td>
<td>Record as asset and/or liability</td>
<td>Reverse recording of asset and/or liability to reflect cash basis reporting</td>
</tr>
<tr>
<td>Purchased goodwill</td>
<td>Record as asset; amortize over up to 40 years</td>
<td>Reverse amortization to reflect original asset amount</td>
</tr>
<tr>
<td>Operating leases</td>
<td>Expense</td>
<td>Record asset and amortize; record liability and related interest</td>
</tr>
<tr>
<td>Bad debts and warranty costs</td>
<td>Estimate accrual</td>
<td>Reverse accruals to reflect cash basis reporting</td>
</tr>
<tr>
<td>LIFO inventory costing</td>
<td>LIFO permitted</td>
<td>Convert to FIFO</td>
</tr>
<tr>
<td>Construction in progress</td>
<td>Record as asset</td>
<td>Remove from assets</td>
</tr>
<tr>
<td>Discontinued operations</td>
<td>Include in assets and earnings</td>
<td>Remove from assets and earnings</td>
</tr>
</tbody>
</table>

As we can see above figure, the effect of capitalizing R&D is to add to CAPITAL (assets) past R&D expenses, less accumulated amortization. The effect on NOPAT (earnings) is to add back current R&D expenses and subtract the period’s amortization of capitalized R&D. For a firm experiencing growth (decline) in R&D, the adjustment increases (reduces) contemporaneous NOPAT. The effect on EVA depends on the amount of capitalized R&D. For a firm in steady state, the
adjustment has little net effect on NOPAT, but increases CAPITAL, thereby reducing EVA.

In particular, above adjustments include: a) to better represent the underlying economics of the transactions; b) to reduce incentives for dysfunctional or sub-optimal decision making; and c) to improve comparability externally (across firms) and internally (e.g., across divisions) by putting the accounting on a similar basis. Not all rationales apply to each adjustment.

In addition to adjust accounting data, to reach a customized definition of EVA that strikes a practical balance between simplicity and precision-one that best meets the company's information needs, existing accounting data, organization and management. At this stage we also determine the appropriate cost of capital, identify the "centers" for which individual EVAs will be calculated on an ongoing basis, and apply each company's proprietary EVA Drivers analysis to a company's operations. EVA Drivers is a set of diagnostic tools that traces the creation of EVA to individual financial and non-financial performance variables and helps managers throughout the company to appreciate how they can influence. Especially, these tailoring processes should satisfy below conditions.

- The change is understandable to operating managers
- The change can be explained to employees, directors, and stockholders
- The change is definitive, i.e. the adjustment can be cast in concrete and left unchanged for a minimum of three years.
• The change aligns calculate EVA more closely with the market value of the firm
• The change involves items that are manageable by those affected

Through above adjustments EVA overcomes shortcoming of traditional accounting and enhance the explanation power for Market Value Added (MVA), definitive measure of wealth creation.

3) Integration of performance measure, incentive system and decision making

The effectiveness of EVA introduction will be maximized when EVA adopting company efficiently integrates EVA as a performance measure, incentive system and decision making tool simultaneously.

According to human nature, people do what you reward them for doing, not what you exhort them to do. In essence, make people accountable for their performance and properly rewards them. If managers make decisions consistent with the incentives of the new EVA-based measures, these actions are generally considered consistent with mitigating agency costs and therefore increasing the shareholders value. Compensation plan should provide one method to mitigate agency conflicts by providing incentive to make decisions that are in the best interest of shareholders. The value of performance measure is determined not simply by its congruity and precision but by its influence on the optimal design.

As we know in chapter 3, if you pay people for generating more EVA and you will
get more EVA and, with it, a higher share price and greater shareholders wealth.

Although there is still some disagreements in relationship between EVA and stock market return, in terms of motivation, measure for asset utilization and decision making for increasing, EVA have shown strong point. Considering necessity for performance measure and the over investment, over capacity problem in Korean companies, EVA will be a good facilitator for shareholders' wealth creation in Korea if Korean companies introduce EVA and link it with the well designed compensation system.
Chapter 6. Conclusion

As we can see in the previous chapters’ review on the current performance measure, empirical study comparisons and EVA adopting non-US company case such as Siemens, EVA has been proven excellent performance measure to motivate management and employees in any company due to its highest correlation with the MVA(Market Value Added), the theoretically definitive performance measure and EVA adopting companies’ superior performance compared with peer non-EVA adopting companies.

Even though still there are some disagreements among researchers to the relationship between EVA and abnormal stock market return in the United States, as I mentioned in “Chapter 3, 3) Summary : EVA and its critic” section, EVA is worthy of attention by Korean companies which want to enhance motivation of their employees and finally increase their shareholders’ value consistently.

If we considered current Korean business environment changes which contain the enhancement of transparency in the corporate governance, the respect for minority shareholders’ right, the collapse of the traditional employment relation between management and labors and the observance to the international business standards by the Korean company, this moment is the best time for Korean companies to introduce the right performance evaluation system. Particularly taking into account the inefficiency in investment and over-capacity problems in many Korean
companies will justify more clearly for adopting proper management performance evaluation measure to use for sustainable wealth creation of shareholders.

In these contexts, I suggest EVA(Economic Value Added) as a new integrated management framework for management performance evaluation, compensation and decision making system for Korean companies. Implemented follow the introduction procedure strategy in chapter 5, specially with the strong support by the owner or top management, EVA will bring significant improvement in productivity and growth by the efficient asset utilization and right decision making for increasing EVA through the link with compensation system. Accordingly, for Korean companies EVA will be a good facilitator for motivating management and employees to go with shareholders' wealth creation in the end if Korean companies introduce EVA and link it with the well designed compensation system.
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