

EVA[®] Compensation Schemes and Controllability Issues

An Empirical Investigation

François Larmande
Ecole de Management de Lyon
UPR Economie, Finance et Gestion
23, Avenue Guy de Collongue
69134 Ecully cedex France

and

Jean-Pierre Ponsard
Ecole Polytechnique and CNRS
1, rue Descartes, 75005 Paris, France

corresponding author : jean-pierre.ponsard@polytechnique.edu

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EVA[®] Compensation Schemes and Controllability Issues: An Empirical Investigation

Abstract: This paper investigates the properties of EVA[®] compensation schemes, which were considered as a major managerial innovation of the 90's. The analysis is carried on in the framework of contract theory and based on a six year longitudinal case study. It is argued that such schemes induce a loss of controllability (the bonus is influenced by factors out of the control of the managers) as compared to more traditional ones. The role of the target setting, based on external standards, and the absence of renegotiation are of particular significance in explaining this loss. This analysis may explain some of the difficulties encountered in the implementation of these schemes and their relative decline.

Keywords: Incentive schemes, controllability, external compensation standards.

JEL classification : D8, J33, M52

1. Introduction

In the nineties many publicly traded companies adopted value based management under the growing pressure of Wall Street (Martin and Petty, 2000). A collection of new metrics to be used as performance measures appeared (Myers, 1996). New compensation plans for managers were designed. The EVA approach (Stewart, 1991, Stern et al., 1995) emerged as a leading figure.¹ The underlying ideas, far from new in many aspects, were considered as “*sufficiently thoughtful and arresting to warrant being included amongst the most significant contributions of recent years to management accounting*” (O’Hanlon and Peasnell, 1998, p. 442). As is common with “management innovations”, after a hot time, there are more firms that drop from such approaches than there are new adopters. Rankings of companies based on EVA and MVA have progressively disappeared from business magazines. This paper provides some evidence to interpret this historical trend and draws some lessons for the design of compensation schemes.

The open motivation put forward by the protagonists of EVA is to make managers run their business units as owners. EVA is assumed to be aligned with market values. As a performance measure, it is said to be decomposable within the organization thus providing more controllable incentives to operational managers than stock options based on the stock market value of the entire company. Some of these assertions have been put into questions. Is it really the case that EVA is better correlated to excess returns than more traditional accounting measures such as earnings per share (Biddle et al., 1996, Bacidore et al., 1997, Stark and Thomas, 1998)? Can it be demonstrated that an annual performance measure can meaningfully summarize the multi-period value of investment (Reichelstein, 1997, Rogerson, 1997, Bromwich and Walker, 1998, Mouritsen, 1998)? Is it the case that EVA promotes alignment with shareholders (Lovata and Costigan, 2002) or within the firm (Riceman et al., 2002)? Pragmatically, is it the case EVA adopters generate higher returns (Wallace, 1997, Kleiman, 1999)? More generally, what do we know about the empirical reasons for adopting EVA and the ways it has been adopted (Haspeslagh et al., 2001, Mottis and Ponsard, 2001-2002, Malmi and Ikaheimo, 2003)?

¹ EVA[®] is a trademark of Stern & Stewart Co.

Contract theory (Lambert, 2001, Prendergast, 1999) suggests that compensation schemes be analyzed along two dimensions: congruity (alignment of the performance indicator with the objectives of the principal) and controllability (the presence in the performance indicator of noisy factors out of control of the agent). The previous literature on EVA focuses on its congruity while its controllability has been taken for granted. This paper shows that it should not. An in depth empirical investigation of an EVA compensation scheme, over a 6 year period, points out to a large loss in controllability. Several hypothesis are tested to explain that loss. Does it come from the performance measure because of the introduction of noisy factors? does it come from the performance target? or does it come from the implementation process and the lack of renegotiation that goes with it?

The main conclusion is that it comes from the target setting process and from the lack of renegotiation, and not from the performance measure as such. The standards in EVA are to be derived from market expectations. They are external, as opposed to internal ones derived for instance from negotiations around budgets (this classification of standards is discussed in Murphy, 2001). External standards are a natural way to obtain congruity. In principle, they are objective and simple, gaming is limited. Jensen (2001) sees the use of external standards in EVA has an important reason to encourage its diffusion. The implementation of this idea is problematic. The determination of the external standard for the company is not a simple matter since market values typically go through cycles. EVA is a performance measure that is decomposed within the organization into many "EVA centers". Setting external standards for each EVA center in a consistent way is not an easy task. On top of possible measurement errors, another important drawback emerges. The elimination of factors out of the control of the operational managers through either *ex ante* or *ex post* variance analysis is much more difficult with external than with internal standards. These issues combine each other to generate the loss of controllability encountered in the case study.

This analysis of EVA suggests the following hypothesis about its diffusion in firms. The reasons for the emergence of EVA may come from its attractiveness to top management because of its presumed congruity. It is a tool to introduce "value creation" all through the organization in reaction to Wall Street pressure. The reasons for its relative decline may come from the counter pressure of divisional and middle managers who do not accept for bonus purposes an incentive scheme on which they have poor controllability. Because of its long time span, the case study illustrates this balance of power and provides interesting clues on how to keep some benefits in congruity while mitigating some difficulties in controllability.

The paper is organized as follows. Section 2 discusses EVA along the lines of contract theory, reviews the literature and elaborates the research hypothesis. Section 3 describes the methodological conditions under which the longitudinal study was carried on. The case study is presented in section 4 and discussed in section 5. The concluding comments derived from the analysis are presented in section 6.

2. EVA and contract theory: review of the literature and research hypothesis

The two dimensions of contract theory, congruity and controllability, and their potential links, are discussed in sequence. The insights provided by the current literature on EVA

are reviewed. Some new ideas relevant for this analysis are introduced as well. This leads to the research hypothesis which is detailed in the last part of this section.

2.1. Is EVA a congruent performance measure?

From a conceptual point of view (Lambert, 2001, section 3) the congruity issue (some authors use the term congruence) concerns the bias between the value function pursued by the firm (for instance the maximization of its long term market value) and the aggregated performance measure used for incentive purposes (for instance an accounting measure). The value function may neither be observable nor contractible while the performance measure should be. As a consequence, the performance measure may only be imperfectly aligned with the value function.²

EVA schemes address the congruity challenge in four steps (O'Hanlon and Peasnell, 1998):

- the design of a yearly performance measure, the old notion of residual income is used as a starting point
- the introduction of adjustments regarding accounting conservatism relative to goodwill, R&D expenses..., earnings management relative to provisions for bad debt, warranties... , methods to value assets ... to derive economic value added from residual income
- the determination of appropriate benchmarks to evaluate value creation, through a methodology that in principle makes the variation of EVA from previous year to this year related to the excess return expected by the shareholders
- the introduction of a bonus bank.

In this process, the ultimate goal is (1) to collapse performance management into a robust, single-period accounting measure, (2) to use NPV preserving adjustments to make this yearly measure unaffected by inappropriate accounting rules, (3) to introduce non zero benchmarks to allow for growing or declining environments whenever a steady state is inappropriate, (4) to use the bonus bank "*as a last line of defense*" (O'Hanlon and Peasnell, p. 410) to induce a long term perspective on the managers.

Consider now the actual result of this process. Is it really the case that EVA is better correlated to excess returns than more traditional accounting measures such as earnings per share? A number of econometric studies (see in particular Biddle et al., 1996) showed that excess returns are better explained by earnings than by residual incomes.³ Whether or not the adjustments made to residual income to obtain EVA reverse the analysis is of course a natural path followed by the supporters of EVA. An indirect way to test congruity is to investigate whether firms that adopt EVA obtain better returns than non adopters. Wallace (1997) and Kleiman (1999) provide some support of that hypothesis, the actual use of EVA for incentive purposes being a key factor to obtain the intended result.

Can it be demonstrated that an annual performance measure can meaningfully summarize the multi-period value of investment? Using simple multi-period

² Another reason for selecting a performance measure distinct from the value function is that the latter may involve too much noise, more on this in the next section.

³ Note that Biddle et al. (1997) may be re-interpreted as evidence about the loss of controllability: their result shows that there is more noise in EVA than in earnings.

frameworks, Reichelstein (1997) and Rogerson (1997) prove that this can be done. But this formal result depends on assumptions which may seem quite restrictive. They focus on the investment decision, the effort choice problem is not explicitly analyzed, assumptions allow to solve it independently. As a result, there is no mention that an increased congruity on the investment decision side could lead to a less controllable monitoring on the effort side. For instance, if the pattern of cash flows cannot be perfectly known, contrary to what Rogerson assumes, the temporal allocation of the total investment cost between periods can increase the noise of each period's performance measure.

Consider now the reasons for adopting EVA and its impact on managers. Lovata and Costigan (2002) show that the EVA adoption rate is higher in firms with high agency problems (a combination of high institutional ownership and low insider ownership). They also show that the rate of adoption is lower in firms with a high R&D ratio, which they relate to the difficulty to construct economic meaningful adjustments. This result shows that EVA adoption is higher when there is a general need for congruity but that intrinsic limitations of EVA may hold back the role of this factor. In a detailed case study Riceman et al., (2002) evaluate the comparative efficiency of managers in relation to the incentive schemes set up within a firm that had selectively adopted EVA. This study is based on questionnaires in which managers are asked to evaluate the relationship between the compensatory scheme that applied to them (EVA or not) and their own performance. Findings show that the higher level of congruity that goes with EVA is an important factor to explain the higher efficiency of the managers involved. The choice of a single indicator along hierarchical lines facilitates organizational congruity, but the authors point out that indicators others than EVA may do as well in this respect.

More generally, empirical studies such as Haspeslagh et al. (2001), Mottis and Ponsard (2001-2002), Malmi and Ikäheimo (2003) do point out the motivation of the top management of the firm to use EVA to promote value creation all through the organization. However, such studies also emphasize the large variances in implementing EVA: what is the involvement of top management, to what extent EVA is part of a more radical strategic change, to which extent is EVA cascaded down in the organization, what is the target process...

This review of literature makes clear that congruity is a central question addressed by the protagonists of EVA and that, with some caveats, a positive answer is at hand.

2.2. Why EVA may not be controllable

Controllability issues are related to the noisy factors that affect the performance measure and are not under the control of the managers. Formally, controllability goes back to the early works of contract theory. It is related to variance analysis as discussed in accounting analysis by Baiman and Demski (1980) as well as to relative performance evaluation (Lambert, 2001, section 2.6). It uses the informativeness principle (Holmstrom, 1979) as a starting point. To our knowledge, this literature focuses on the controllability of the performance measure as such and not on the target setting process, which is key in our analysis.

Intuitively, it seems reasonable that a manager should be accountable only for outcomes that are under his control. Consequently, the more accountable the incentive scheme, the better it is. As regards EVA, the idea is to decompose the overall performance measure obtained for the whole company into (additive) performance measures for each business unit (to be called for that respect EVA centers). Because of its linkage with accounting figures, EVA is supposed to be easily decomposable as well. The associated information process is usually attributed to an “EVA administrator” who typically belongs to the control department. Is it the case that this local performance measure be controllable by the operational manager in charge of the corresponding business unit? In this section we assume that it is not, which remains to be proven, and we investigate why this may be the case.

The literature on the controllability of EVA schemes is in fact almost non-existent. A notable exception concerns Bromwich and Walker (1998). They review EVA schemes in the light of the early implementations of residual incomes (Solomons, 1965). For these authors, the important (controllability) issues which appeared at that time remain relevant for EVA: the question of decentralization within the firm, the fact that some decisions depend more on corporate than on divisional decision making, the need to distinguish between managers evaluation and the assessment of divisional performance.

Note that these comments would apply as well to traditional performance measures such as NOPAT or ROCE when they were computed at the business unit level and used for incentive purposes. Indeed, since capital employed is controlled by the firm, EVA should not be more volatile than NOPAT or ROCE. Similarly, factors such as the arbitrary allocation of corporate expenses or the accountability of decisions made by the corporate without the involvement of the divisions should not in principle lead to a loss of controllability with EVA relative to NOPAT or ROCE. Substituting EVA to these accounting measures should not induce a relative loss of controllability unless there is something specifically unpredictable in the adjustments made to derive EVA from accounting figures. This provides a first line of investigation.

Another line of investigation comes from the target setting mechanism. The standards of an EVA scheme are derived from market expectations and not from internal negotiations. Does this difference generate a possible loss of controllability?

To carry on the argument, it is necessary to review in detail the methodology used by EVA to generate standards. This presentation draws from O’Byrne (1997), a former partner in S&S (see also O’Byrne and Young, 2006, for a recent article that introduces some variants).

- Start from the formal equality between the discounted value of future residual incomes and the discounted value of future cash flows; since the EVA adjustments preserve this relationship, and since from standard finance the value of the firm is the discounted value of its future cash flows, one gets:

$$MVA_0 = \sum_n EVA_n / (1+wacc)^n$$

in which MVA stands for the excess of market value over invested capital (equity and debt claims) and wacc for the weighted average cost of capital

- EVA_0 is known, MVA_0 can be measured from the stock price of the company

- The future benchmarks for the EVA_n are defined as increments of EVA_n relative to EVA_{n-1} , these increments are called the “expected improvements” and noted EI_n
- Assume stationary EI_n 's for a number of years, and then posit an infinite leveling off towards zero, the above relationship can be solved to identify the stationary value for EI
- This procedure generates the standard for some years, the whole evaluation process being repeated later on.

This method was in use in the early 90s and applied in medium size companies operating in stable environments, such as Briggs&Stratton, a primer on EVA.

- In the mid 90's, S&S developed more elaborate econometric methods based on longitudinal analyses at industry level. In this case they talk of "industry curve". For a given year k in the past and for a given firm i in the industry a constant preliminary EI_{ik} is determined using an initial EVA_{ik-1} and the market value added at year k through the methodology described earlier
- This generates a data base (EI_{ik} and EVA_{ik-1}) over a number of recent years and a number of quoted firms in the same sector. A regression is tested between EI and EVA . Ordinarily this produces a negative linear relationship ($EI = aEVA + b$, in which a and b are two constants and $a < 0$)
- Each year n , the actual EI_n to be used as the benchmark is $aEVA_{n-1} + b$. This method was proposed as a way to extend the previous methodology from stable to more cyclical environments.

One may have legitimate doubts on the conceptual and operational validity of this methodology to set up standards.⁴ The relationship between MVA and the discounted value of future EVA's is only valid with a perfect financial market, the adopted profile for future EVA's is highly questionable, and the attempts to introduce some form of relative performance evaluation through an industry curve accumulates these questionable assumptions with potential measurement errors. The way to proceed from this “corporate EI” to the “EVA centers” EI's of the firm is not detailed and stands as a potential source of problems for implementation, since EVA centers ordinarily are not quoted. This provides our second line of investigation for an eventual loss of controllability: managers may be submitted to targets which contain noisy factors the origins of which they neither understand nor control.

Our third line of investigation is related to the actual process that leads from the performance measure and the target setting to the actual payment of the bonus. EVA methodology provides very little space for the elimination of uncontrollable factors through negotiation. This appears better if one has in mind the process in the case of internal benchmarks. Merchant (1989) provides an insightful discussion of that internal process. The budget is usually a bottom up construction based on explicit environmental factors (demand volumes, input and output prices...). This allows for a sensitivity analysis which provides an objective playing field for *ex-ante* and *ex-post* negotiations. This is impossible with the methodology used by EVA to generate its external benchmarks.

⁴ Bromwich (1973) points out a potential flaw in using the present value of future cash flows for setting standards, this introduces a closed loop between these future cash flows and the standard, the quality of management cannot be rewarded since it is expected. This comment applies as well to the SIT adjustment (section 4.3.)

Admittedly, due to asymmetric information, managers may take advantage of an internal target setting process to get advantageous bonuses. Indeed, it is often observed that traditional accounting bonuses have little variability in spite of large changes in profitability, thus the encouragement for stock options for top managers. This means that controllability and manipulability may be difficult to disentangle in practice.

2.3. The research hypothesis

Ideally, best compensation schemes should be both congruent and controllable. As a matter of fact, it seems difficult to design a scheme that optimally combines both dimensions (Feltham and Xie, 1994, Datar et al, 2001). Many compensation schemes encountered in practice favor one dimension or the other. Baker (2002) illustrates the tradeoff and the pitfalls for neglecting it: focusing on cost (easily controllable) while neglecting quality (important for congruity but harder to control), focusing on short term measures (easily controllable) while neglecting long term ones (more congruent but harder to control), etc. Ittner et al. (2003) also provide evidence on the difficulties to properly balance multiple measures.

The preceding discussion suggests that EVA may be viewed as favoring congruity over controllability. Our hypothesis can then be summarized as follows.

Hypothesis 1: Is it the fact that the introduction of EVA schemes induces a loss of controllability relative to more traditional compensation schemes? How can this loss be eventually measured?

Assuming that this hypothesis is validated, three possible explanations are put forward for further testing.

Hypothesis 2: Does this loss come from the introduction of noisy elements in the performance measure?

Hypothesis 3: Does this loss come from the introduction of unpredictable elements in the external target setting?

Hypothesis 4: Does this loss come from the absence of renegotiation that determines the actual bonus from the performance measure and the target?

The discussion of these various hypothesis should provide some light on the reasons for introducing EVA and on its relative decline. The following hypothesis is proposed.

Hypothesis 5: If an organization is to keep EVA for congruity reasons, the controllability issues will have to be explicitly addressed by the top management, two avenues seem plausible:

- to revise the EVA scheme to introduce more controllability
- to keep the EVA scheme but to reduce its weight in the global compensation scheme by introducing other more “controllable” components.

The history of EVA in the organization would then be interpreted as: firstly a brutal change of power in favor of top management to introduce “value creation” all through

the organization, secondly a progressive shift back to a situation in which operational managers control (manipulate) the incentive scheme to which they are submitted.

3. Research methodology

The longitudinal study took place between 1999 and 2006. This section reviews the interactions the authors had with the company, where the data come from, who has been interviewed and what the questions were.

Several interactions with the company XYZ took place over the period. In 1999, Ponsard (in collaboration with the EVA project leader at XYZ), made a survey of the implementations of value based management as a consulting job for XYZ. A dozen companies in the US and in Europe were identified as “EVA companies”. Typically the H&R and the Finance managers were interviewed for a couple of hours. The questions covered the following topics: why and how was EVA implemented, what was the involvement of the top management, what were the main adjustments, what was the target setting process, how far down the organization the EVA centers were defined, what assessments could be made about the benefits and pitfalls of the implementation. An independent research project used that survey as a starting point to provide a taxonomy of implementations of value based management (Mottis and Ponsard, 2001-2002).

In 2002, Larmande and Ponsard worked on a consulting assignment for XYZ. The objective was to provide an assessment of the first three years of operations of the EVA compensation plan. Information was collected regarding the specificities of the plan implemented at XYZ and on the motivation for these specificities. A hard (“archival”) data base was constructed on the actual performance measures used for all the EVA centers of the company, their calibration to get the bonuses and the bonuses that were indeed paid in 2000, 2001 and 2002. Exceptions to the general formula were identified and analyzed. Systematic interviews were carried on with the heads of the four divisional H&R departments. Each interview would typically go on for two hours and be based on an in depth discussion of the actual outcomes for the division and of its BU’s using the data base. Preliminary conclusions were discussed with the head of corporate control, the manager that had been in charge of the EVA project and some senior executives.

Our analysis of the EVA compensation scheme over 2000, 2001 and 2002 pointed out some important deficiencies. Based on this assessment, our role was more to simulate various proposals discussed at the top management level, using the data base that had been constructed, than to advocate for precise recommendations.

In 2006, an interview with a senior H&R executive was made to have his analysis of the changes made on 2003. Further changes that had been implemented in 2006 were also discussed. We obtained access to the company EVA data base, that included now the years 2003, 2004 and 2005, for research purposes.

This research project is unusual from a methodological point of view. We do not start from well stated research questions and go in the field to test them. In a way we observed the implementation of a compensation scheme over a long period of time and

we use contract theory to interpret the findings that seem to emerge. In our opinion, the fact that these findings primarily come from hard data and that we had no vested interest in advocating for or against the actual incentive schemes being implemented make the discussion fairly objective.

The informational content of this article has been cleared by XYZ as far as confidentiality is concerned. The interpretation of the results remains our sole responsibility.

4. The longitudinal study (XYZ 2000-2005)

4.1. The context

In 2000 XYZ operated in over 70 countries with a 12 billion dollar turnover and 65,000 employees. In 2005, the turnover had grown to around 20 billion dollar mostly through acquisitions.

The activity of XYZ is in the construction material business. This business has two important economic characteristics: (i) high capital intensity, due to high costs of new plants and of maintenance on industrial equipment, (ii) high delivery costs of its products. XYZ's organizational structure reflects these two characteristics: it is a collection of investment centers (to be referred as business units and abbreviated as BU) managed through four divisions corresponding to four major lines of business. Note for further discussion that the divisions are unequal in size, revenue and profit. One division may be called the core business of the company. In 2001 it had around 60 BU's and more than 100 in 2005.

This decentralized structure makes the business quite different from global ones such as telecoms or pharmaceuticals in which decisions are more centralized. In XYZ local managers have a large spectrum of responsibility. Business units are in charge of operational decisions, including pricing, product mix, operating costs and maintenance. They have the responsibility of generating profits on a given set of assets operating over a given geographic area. However they may not control all capital expenditures relative to their investment center: large capital investment projects such as plant restructuring and acquisitions or divestitures are made at the divisional level or even at the corporate level, depending on their magnitude.

During the 1990s several initiatives were taken to introduce the concept of "value creation". Reports on investment choices had to show value created more explicitly. Analyses of net discounted value had to be quantified in relation to key performance indicators that could be updated. Acquisitions had to explain the corresponding synergies and economies. But most of these cases involved only a handful of senior executives in each division, and most of the capital expenditures were still determined by organizational routines. At operational level attention remained focused on the income statement.

The top management decided that another way had to be found to mobilize all members of the executive committees of all business units, *i.e.* about 1,000 to 1,200 managers in 2000, around the notion of value creation. The EVA approach, based on a new performance measure and on a revision of the compensation system, appeared as an

appropriate way to achieve this goal. The decision to adopt it was taken in 1998. In 2000 the new compensation system had been established and gradually applied throughout the firm. The system was revised in 2003 and again in 2006.

The next sections describe the successive compensation plans starting from what was in place prior to 2000, the new plan based on EVA, as well as the changes introduced in 2003 and 2006.

4.2. The variable compensation system before 2000

Before the year 2000 several variable compensation schemes existed in the XYZ Group. The information is scattered in the divisions. Practice depended on the product line and on the country.

- the performance indicator on which the bonus was calculated was the EBITDA or the EBIT, or exceptionally the ROCE; in some countries there were no individual variable bonus
- the standard was determined internally, BU by BU
- this determination of the standard consisted in a negotiation between the head of the BU and her/his superior (division manager), that took into account the current year's budget and the previous year's result
- the calibration could be linear or not linear but always included caps and floors
- this “financial” component regarding the performance of the BU was then integrated into a larger assessment of indicators which involved personal objectives associated to each BU manager
- though the bonus could theoretically vary on a scale from 0% to 100%, 50% being the fair bonus, the observed bonus would usually establish between 65% and 85%.

4.3. The initial compensation plan: 2000-2002

The approach followed the general S&S framework as summarized in section 2: the four steps identified by O'Hanlon and Peasnell (1998) and the target setting process detailed in O'Byrne (1997). The main differences will be emphasized.

(i) Defining the EVA performance measure for each BU

The general idea was to push the EVA performance measure as far down the organization as possible: the Group level, the four divisions, the BU's. The case study focuses on the BU level.

The economic characteristics of the business make it fairly easy to break down the NOPAT and the capital employed from the company level to divisional and then business unit levels. The cost of capital is defined at the corporate level and this cost taken identical all through the company. This allows the computation of the residual income (RI) for all BU's.

From this RI measure, two adjustments were made to define EVA. An “economic adjusted asset” was preferred to the book value to reflect the market value of the BU. For a recently acquired business, the economic adjusted asset is the acquisition price (including goodwill); for older BU's, value judgments were made at the corporate level. According to the EVA project leader, the main reason for this adjustment was to avoid

highly positive EVA for older assets and low or negative EVA for recent assets. Such accounting distortions would otherwise trigger unfair internal value judgments. The adjustment was not made for portfolio analysis purposes.

The other adjustment concerned the “strategic investment treatment” (SIT), as recommended by Stern and Stewart’s methodology. Given that certain major investments in the firm can have deferred returns and in order not to discourage this type of investment through the bonus scheme, the negative EVA’s of the first years (e.g. for three years), as forecasted in the business plan, are capitalized and charged uniformly over time later on in the future. Over the next three years, only the gap between the observed EVA and the expected EVA in the business plan will impact the bonus. Only large investments would be concerned for a SIT.

All the EVA calculations for a business unit, whatever its geographical location, would take place in the currency used by XYZ for its financial statements. This is important since many BU’s have their reporting statements in local currencies. The reason for this is to encourage the BU’s to be accountable for capital employed in the currency used to get the funds.

(ii) Calibration: the standard and the strength of the bonus scheme

From the EVA indicators, the following yearly performance indexes (PI) were constructed at all levels of the organization:

$$PI = 1 + (\text{this year EVA} - \text{previous year EVA} - \text{Expected Improvement}) / \text{Interval EVA}$$

A PI of 100% is to be interpreted as a fair bonus. The Interval EVA captures the “strength” of the bonus scheme: the smaller the Interval the stronger this strength. A PI less than 0% means poor performance while a PI higher than 200% means an outstanding performance. The selection of the intervals were considered to be the responsibility of the divisions, they were determined by taking into account the business units projected results and the subjective appreciation of their volatility.

The target setting to obtain the EI was as follows:

- The industry curve was used to set the EI at the group level in 2000
- The EI at the group level was first broken down on each division, then within each division on each BU, so that the sum of EIs at each level (BU or divisions) would equal the EI at the higher level (divisions or group, respectively). In this cascading down process two considerations were used. First, the estimated industry curve was applied mechanically at each disaggregated level. Second, these initial EI proposals were submitted to BU managers and compared to their respective strategic five-year plans. Since most of these EIs would lead to lower projections than the internal forecast, they were seldom challenged
- It was decided that these EI’s, as calculated by the above process, would remain constant over the next three years and then would be updated.

(iii) The bonus scheme: annual and pluri-annual bonuses

From the performance indexes two bonuses were determined for each organizational level: a yearly bonus and a three year bonus to be paid over the period 2000-2001-2002.

The yearly bonus is zero if the PI is less or equal to 0%, linear from 0% to 200% and constant over 200%. This is a standard system with cap and floor.

The three-year bonus is also a cap and floor system: (i) the average value of the three PI's, one for each year, is computed, (ii) the floor is at 100% while the cap remains at 200%. The three year bonus is more challenging than the annual one. According to the EVA project manager, this approach was preferred to a bonus bank to allow managers to obtain a positive yearly bonus whatever their past results would be. With a bonus bank, it may take several years to overcome an exceptionally bad year.

The size of the variable fair annual bonus (roughly between 12% and 30% of the basic salary, depending on the level of responsibility) was harmonized throughout the group. Half of this annual bonus was to depend automatically on the EVA. The other half was determined in relation to quantified personal objectives, this part remained to be monitored at the decentralized hierarchical level.

On top of these two components, the three-year bonus was to be considered as an exceptional bonus for outstanding performance, it would only applied to managers high enough in the organizational ranking.

A manager who belongs to the executive committee of a BU would typically get the yearly EVA bonus of his or her unit. The manager in charge of the BU would get a EVA bonus calculated as two thirds on the results of his or her unit and one-third on the results of the division to which this BU is affiliated. Depending on their ranking, he or she may also get the three year EVA bonus.

At the divisional level, the same procedure applies. The managers at the corporate level have EVA bonuses that only depend on the results of the company as such.

The performance measure process (keeping track of EVA calculations, of the adjustments, introducing further standard adjustments for change in scope, computing the PI's, ...) was administered by the corporate control department. The human resources departments of each division would determine the actual individual EVA bonuses from the PI's.

4.4. The updated plan: 2003-2005

The main changes implemented from 2003 concerned three aspects of the compensation plan.

(i) The EVA calculations

A number of simplifications were introduced. The calculations of NOPAT would delete exceptional non recurring items. A direct change in the EI was substituted to the SIT adjustment. The impact of currency changes was simplified and no longer followed the detailed accounting treatments for such matters. At the BU level, local currency would be used for lower level managers eligible for EVA bonuses. The corporate provided a reassessment of the "economic adjusted assets" for each BU.

(ii) The Expected Improvements and the Intervals

An internal note issued by the top management to motivate the changes says: *“We keep the basic principle of a financial bonus tied to actual EVA variation, compared with an “external” target not related to budget. The second half of the bonus, tied to personal objectives, ensures that the quality of efforts made is rewarded, even if the environment has been so tough that financial results have not been achieved.”*

This is an important statement put forward by the top management, it clearly advocates that the main objective for the EVA system at XYZ is to make managers aware of the financial “objective” performance of the company at all levels. It was not announced so clearly to the organization in 2000.

However a certain margin of flexibility in the objective-setting mechanism to recognize specially difficult situations was introduced in 2003. Firstly, external standards for expected improvements would be set each year for the following year (while in the initial plan the same EI were to be used for three years). The reference to the “industry curve” approach is abandoned and replaced by a simple principle: (i) a BU with negative EVA must be able to go back to positive EVA in k years, (ii) a BU with a positive EVA must generate at least some percentage of capital employed, which means the return on capital is expected to increase by this percentage.⁵ Secondly, the actual EI may differ from this external standard, the divisions can modulate them to recognize different situations in their different BU’s, provided the sum of their units EI’s corresponds at least to the division EI. Thirdly, a simple consistency check with market expectations is done at the group level, without further reference to an industry curve.

The Intervals were enlarged to better reflect the relative volatility of the environment for each type of business. Globally, the target spread given by the corporate to each division was that approximately 2/3 of BU’s should be in the linear part of the bonus range with 1/6 at no bonus and 1/6 at maximal bonus.

The three year bonus was changed to a revolving long term bonus based on the average of the PI’s obtained in the last three years. Yet, this bonus remained more demanding as the yearly bonus with a floor set at 100% and not at 0%.

4.5. Further changes: the compensation plan 2006 onwards

In 2006, further changes occurred in the compensation plan. The long term bonus was abandoned all together. It was replaced by a “collective performance” bonus based on two parts:

- a performance indicator of company XYZ relative to its peers, this indicator uniformly applies to all managers whatever their BU or division
- a key performance indicator specific to each division to be declined down to all its BU’s; the BU indicators may slightly differ within each division.

From 2006 onwards, the compensation system at XYZ contains three components:

- 1/3 based on the yearly annual increase in EVA as defined in the 2003 plan
- 1/3 based on a new collective performance measure

⁵ The exact figures for k and the increase in return on capital are confidential.

- 1/3 based on traditional personal objectives.

5. Analysis of the case study

We now analyze this case study with respect to the research hypothesis stated in section 2.3.

- Are the bonuses generated by EVA objectively more volatile than what was observed previously in the organization?
- Do the managers perceived this volatility as a general loss of controllability?
- Is it possible to relate this subjective loss to the factors identified: the performance measure, the target setting and/or the absence of renegotiation?
- What does this case study contribute as regards the history of EVA and its relative decline?

5.1. The initial plan (2000-2002), the loss of controllability and the test of hypothesis 1

Consider first the actual bonuses paid over the first years of operations of the compensation plan. Table 1 displays the pay-outs associated to all BU's in company XYZ. The classification gives the percentage of zero bonus (floor), intermediate bonus (on the linear range) and maximal bonus (cap) for the successive years as well as the three year bonus paid in 2002 and relative to 2000-2001-2002. The spread is extremely large as compared to what is usually observed in most companies. Recall that in company XYZ most managers had experienced a system of bonus the range of which was from 65% to 85%!

		All BU's	
% of BUs	classification	Yearly Bonus	Three year Bonus
2000	100%	39%	
	intermediate	35%	
	0%	26%	
2001	100%	32%	
	intermediate	29%	
	0%	39%	
2002	100%	27%	23%
	intermediate	45%	30%
	0%	28%	47%

Table 1: the spread of bonuses for the initial plan

Here are the comments collected in the 2002 interviews that illustrate the perceived loss of controllability:

- The high level of volatility of bonuses granted was imputed primarily to external economic conditions (in some cases, a simple variance analysis was put forward to advocate this view). The new system thus seemed to reward results more than managers' efforts, as opposed to their past experience. In certain extreme cases managers felt that it was simply a question of the luck of the draw. Of course, managers with high bonuses did not complain about the system
- From the second and third year of application of the system, several units complained that even before the beginning of the year, all hope of a bonus seemed inaccessible when

they compared their budget with the "standard" fixed one or two years earlier. In their opinion the bonus system had lost much of its relevance due to the change of context. They considered that certain BU's were simply "carried" by their environment, something that seemed unfair and caused them to question the rationale of the system

- In some instances managers would be reluctant to accept internal mobility proposals in the perspective of losing a high predictable bonus

- The origin of the difficulties somewhat differed, depending on whether the BU belonged to the firm for some time or to entities that had recently been acquired. In the former case, unexpected moves by competitors were put forward as an environmental factor that made the initial standard totally obsolete. In the latter case, the price paid for the acquisition, to which the managers in charge were not responsible, was considered as imposing unrealistic capital charges for their BU.

To remedy this situation, but only in extreme cases, the top management decided to "neutralize" the bonus system of certain BU's. This neutralization operated as follows: (i) an *ex-post* re-evaluation of the bonus parameters so that the BU obtained the fair bonus, (ii) the elimination of the unit in the calculations of the bonus for the division, so that the divisional managers would not be penalized by a unit whose results were too bad.

5.2. The factors that explain this loss of controllability: the test of hypothesis 2 and 3

Can one relate the loss of controllability as perceived by the managers to the objective factors envisaged in section 2. Consider first the EVA measure as such.

- some components regarding the treatment of exceptional items in the NOPAT may be less predictable than in an EBIT discussed internally without the rigor of accounting rules as seemed to be the rule in XYZ

- Some managers insisted on the unpredictability of exchange rates and on the arbitrary rules associated with some accounting operations such as the treatment of pensions. On the other hand, the SIT adjustment should not affect the predictability for the capital calculations.

These are valid reasons for some loss of controllability, but their relevance should be limited to some BU's (exchange rates) and can be easily corrected (pensions).

Consider now the impact of the external target setting. This factor is directly connected to some of the comments made by the managers. Their arguments amount to this: "*given the cap and floor structure of the bonus, if from the very start, the objective is too stretched (the EI is too high), then I have no way to get a fair bonus*". This means that the bonus scheme is out of the control of the manager in the following sense: there is no way to get some bonus through the effort deployed. As reported by the H&R managers, the vast majority of operational managers recommended to revert to an internal standard in which the EI would be set with reference to the budget.

To objectively test whether the target setting is responsible for the loss of control we have computed what the performance indexes would have been for year 2002, had the budget been used instead of the external EI.

(insert graph 1 about here)

The results are displayed graphically (graph 1). It can be observed that there are almost no correlation between internal and external PI (the R^2 coefficient is .241). This proves that the change is indeed drastic and may very well be the main factor for the perceived loss of controllability. In fact, we shall argue later on that this is only part of the story.

Consider now the changes introduced in 2003. They can be seen as introducing more controllability even if it does not go as far as the suggestions of the operational managers: allow for some flexibility in the target setting process (while keeping an external standard) and enlarge the Intervals to take account of the volatility of the EVA performance measure.

5.3. The second plan (2003-2005) and the test of hypothesis 4

We now test further the role of target setting. It will first be shown that, due to the changes, the external standard is now much closer to an internal standard based on budget. Yet, the volatility of bonuses persist and with it the subjective perception of the loss of controllability. This brings into the picture the third factor: the renegotiation.

The 2005 results are used to test the proximity of the new target setting with the budget. The results are displayed in graph 2. The R^2 coefficient is now .602, which is quite significant. Yet the external standard plays a dominant role (see graph 3, the R^2 coefficient is .947).

(insert graphs 2 and 3 about here)

This can be made more precise through a multifactor regression analysis. The results are displayed in table 2. For further discussion, it is also interesting to run this regression for the BU's which belongs to the core business of company XYZ (table 2 bis).

All BU's	R-squared	0.9508	Number of observations	117
Observed PI	F-value	1100.73	Signif. F	= 0.0000
	Regression Coeff.		t-value	Signif t
	PI with EI budget	.1070351	3.27	0.001
	PI with EI formula	.8396958	28.26	0.000
	Constant	-.8855804	-0.21	0.835

Table 2: the regression of observed PI with respect to budget and formula for all BU's

Core business	R-squared	0.9827	Number of observations	45
BU's	F-value	1194.20	Signif. F	= 0.0000
Observed PI	Regression Coeff.		t-value	Signif t
	PI with EI budget	.4839316	8.68	0.000
	PI with EI formula	.5056677	10.86	0.000
	Constant	3.000619	0.78	0.441

Table 2bis: the regression of observed PI for the core business BU's

In both cases the regression coefficients are highly significant. Table 2 demonstrates the dominant role of the external standard (while table 2bis exhibits a more balanced combination).

How can one explain that the observed EI moves from the external standard towards the budget EI? Two explanations are to be considered: (i) the budget process itself is strongly influenced by the external target, (ii) the divisional managers use the flexibility offered by the new target setting to adjust the external standards to the environmental specificities of the BU's, specificities which are embedded in the budget. The second explanation seems more plausible. The budget is made in November of the previous year while the target setting is made in March of the current year, once the actual EVA of the previous year is definitely known. This timing rules out the assumption that it is the budget that adjusts to the external standard. Our hypothesis is that the adjustment goes in the direction of the budget (and of the current year results observed through the first quarter) but that the external standard remains a strong anchoring target.

Since the two standards are close to each other, and since the intervals are now more meaningful, the relative spreads in bonuses would have been similar with an internal standard based on budget as with EVA (table 3). In terms of mean values and standard deviations, the two series are statistically not distinguishable.

Year 2005 All 122 BU's	Performance indexes	
	Observed	Budget as EI
mean value	91%	85%
stand deviation	1,81	1,75

Table 3: comparisons of the spreads obtained with the actual EI and with budget

The complete picture for the bonuses over the three years 2003, 2004 and 2005 shows that volatility remains high (table 4). How is it that with standards based on budgets and with intervals discussed by divisional managers, the previous system generated bonuses in such a narrow spread as from 65 % to 85 % while these spreads are more larger?

Our hypothesis is that it come from the renegotiation process: the fact that the EVA system is conceptually associated to external market expectations and that it is administered through a heavy accounting process by the control department, reduces the flexibility for operational managers to make the relevant *ex-post* adjustments to eliminate out of control environmental factors. Comments regarding the system prior to 2000 were such as “*budget was made under this and this assumption, ex-post let us recalculate the true reference to assess the bonus*”. Such adjustments cannot be made with external standard. The changes reported in section 4.3. exemplify the unsatisfactory take it or leave it option to remedy extreme situations.

% of BUs	classification	All BU's	
		Yearly Bonus	Three year Bonus
2003	100%	18%	18%
	intermediate	61%	38%
	0%	21%	45%
2004	100%	19%	13%
	intermediate	60%	39%
	0%	21%	48%
2005	100%	21%	11%
	intermediate	55%	31%
	0%	24%	58%

Table 4: the spread of bonuses for the second plan

This result calls for the qualification mentioned in section 2.2. From interviews with senior executives, it appears that the lack of confidence of the top management of XYZ in the objectivity of the internal renegotiation process, with its gaming around budget, triggered the adoption of a more “objective” system based on an external standard. It seems fair to conclude that the subjective controllability of the earlier system perceived by the managers comes partly from their ability to manipulate an internal standard to obtain (large) predictable bonuses.

5.4. The third plan (2006 onwards), further test of hypothesis 5 and the overall story

At this point, we have a system based on a performance measure: (i) that is not much noisier than previous measures used in the company (thanks in particular to the changes made in EVA calculations), (ii) in which some limited adjustments can take place *ex-ante* at the target setting phase, (iii) but in which no *ex-post* renegotiation is feasible. The changes made in 2003 are well in line with hypothesis 5 part 1.

But the large spread of bonuses remains, for the yearly bonus and for the long term bonus (table 4). According to the limited interviews made in 2006 recurrent pressures for change were still rampant. What else can be done if the top management still wants to keep EVA?

One may interpret the further changes that took place in 2006 are a further push towards more controllability. The more uncontrollable part, *i.e.* the long term bonus, was abandoned for more traditional performance indicators constructed either on benchmarks relative to peers and on internal standards. This is consistent with hypothesis 5, part 2.

In spite of its apparent complexity, the system in place in 2006 rationally reflects our interpretation of the history of EVA. This interpretation is based on two conflicting forces: on the one hand, the initial willingness of the top management to implement a system that emphasizes value creation at all levels of the organization and on the other hand, the progressive counter pressure from the operational managers to have a system that rewards their efforts and eliminate factors out of their control.

Recall that company XYZ has a core division from where most of the profit comes. One may hypothesize that operational managers in that division enjoy a higher status. They certainly have more power to have the incentive scheme serve their interest. Come back

to table 2bis. The observed EI's for the BU's in the core business are more balanced in favor of budget than those of other BU's. This consistent with our overall story of EVA.

6. Concluding comments

EVA bonus schemes are in principle designed to reinforce the congruity of the performance measure with the profit maximization objectives of the firm while preserving controllability at the business unit level. Company XYZ qualifies as a good representative of what is meant by EVA companies. The reliance on accounting data, the introduction of adjustments, the use of external standards, the use of a long term perspective for the bonus, all these features have been implemented at XYZ. The case study covers the functioning of the scheme over a 6 year period, from its introduction up to two incremental changes. Actual results and the motivations for change are analyzed.

The EVA system implemented at XYZ suffers from a lack of controllability. Firstly, EVA calculations cannot completely eliminate complex and arbitrary accounting treatments which introduce an internal administrative noise in the process. Secondly, the way targets are set within the organizational structure introduces further volatility. Thirdly, and more importantly, that the external process for setting target excludes negotiation. The very idea to use an external standard in order to dissociate the target definition from the budget process, as suggested in Jensen (2001), generates standards down the organization which may not be understood by the operational managers and that cannot be readjusted in face of uncontrollable events through either *ex ante* or *ex post* negotiation. This result may have some bearing for other schemes based on external standards. This is proposed as a first line for future research.

Observations coming from other companies seem to collaborate the analysis of the case study, even if the actual outcomes may be somehow different. In particular, the ATT story as reported in Ittner et al. (1998) can be interpreted in this perspective. The commitment to a "pure" EVA scheme was quickly followed by the introduction of measures of customer and employee satisfaction that we interpret as a way to enhance controllability. Technical difficulties appeared: the fact that EI and Interval are absolute numbers made updating tedious in face of numerous structural changes. This reduced the adhesion of managers to an indicator which was complex to follow, again a controllability issue. On top of that the disconnection that appeared between EVA and MVA made the congruity questionable.

These limitations of EVA as an incentive scheme should not forgo its educational value, a point which contributed to its managerial success and which is the major reason why company XYZ decided to keep the scheme while some companies, as ATT did, decided to abandon it. These limitations should not also lead to ignore the pitfalls of traditional compensation plans based on budget. These schemes are often manipulated by operational managers to obtain recurrent high bonuses and they may hinder the budget coordination process as well.

Given that the situation that prevailed prior to the introduction of EVA was one in which the bonuses remained in a small predictable range, whatever the financial result of the business units, the introduction of EVA in company XYZ may be considered as a brutal change of power in favor of top management to introduce "value creation" all through the organization. However, the operational managers reacted to this change, and the top

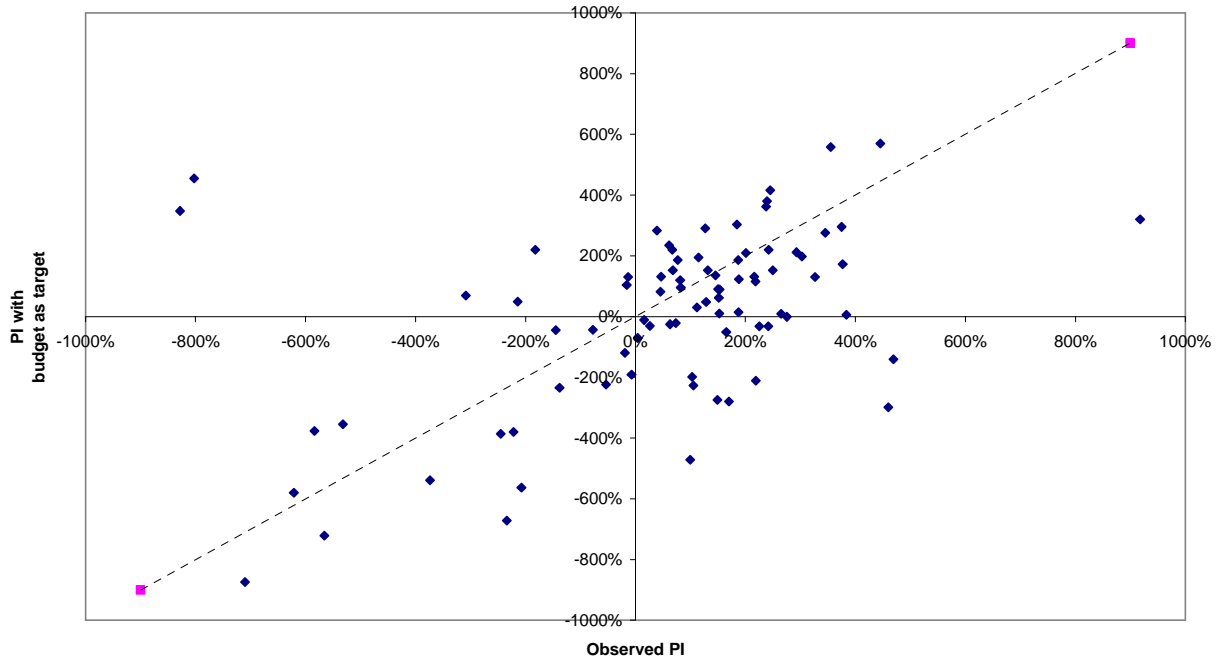
management had to progressively reintroduce, firstly in 2003 and then in 2006, some form of controllability. The incentive scheme in place in 2006 materializes a compromise and some balance of power between top and middle management. This is offered as general hypothesis to be tested in future research.

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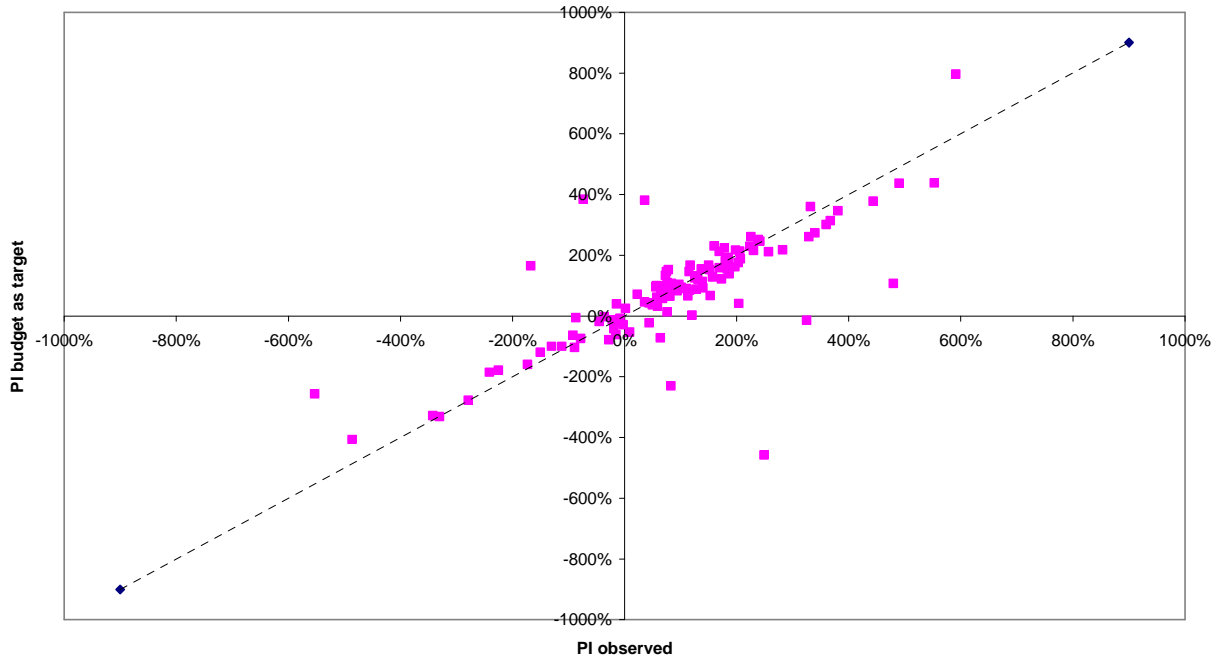
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PI 2002 EI versus Budget



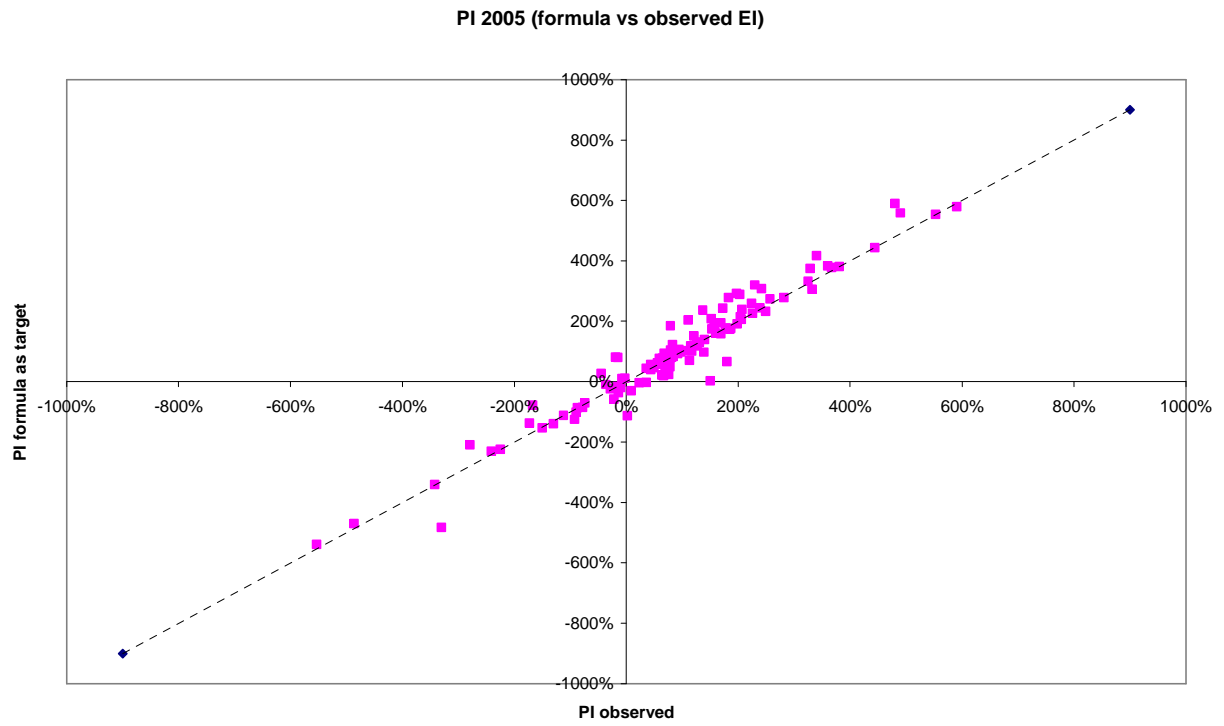
Graph 1: The 2002 performance indexes with EI based on budget versus actual EI

PI 2005 (budget vs EI)



Graph 2: The 2005 performance indexes with EI based on budget versus actual EI

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Graph 3: The 2005 performance indexes with EI based on formula versus actual EI