

# Performance effects of using the Balanced Scorecard: a note on the Dutch experience

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This article aims to contribute to understanding how to use the Balanced Scorecard (BSC) effectively. The BSC lends itself to various interpretations. This article explores how the way in which the BSC is used affects performance. Empirical evidence from Dutch firms suggests BSC use will not automatically improve company performance, but that the manner of its use matters: BSC use that complements corporate strategy positively influences company performance, while BSC use that is not related to the strategy may decrease it. We discuss the findings and offer managers guidance for optimal use of the BSC.

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*The danger is that managers' expectations may be raised too much. . .*

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## Introduction

The Balanced Scorecard (BSC) is a strategic management system that aims to clarify strategy and to translate it into action.<sup>1</sup> It is widely used by organizations as a tool to assess and manage their companies' organizational performance. In their publications regarding the BSC, Kaplan and Norton have emphasized the need for companies to align their BSC with their strategy in order to reach maximum benefits. They illustrate and support their ideas with 'case-type' examples. However, surprisingly little research has been done to examine Kaplan and Norton's performance claim and its generalizability using larger samples.<sup>2</sup> The danger is that managers' expectations may be raised too much, leading to potential disappointment.<sup>3</sup> As an 'ideational' innovation, i.e. novel ideas that lack a material component,<sup>4</sup> the BSC lends itself to various interpretations. Under the same label, the BSC can be and is used in different ways involving

many different functional areas and indicators. Different ways of implementing and using the BSC may have different effects on company performance.<sup>5</sup> As the Exhibit shows, usage of the BSC will not *automatically* improve company performance. The case of the financial institution illustrates that BSC interpretation and implementation are not straightforward. The company made three attempts to implement and use the BSC, and each time it was interpreted and used differently. The first two implementations were disappointing, but the third and final attempt was successful. As one respondent commented, *‘The BSC is a good concept but at the same time the instrument’s actual guidelines are vague, maybe too vague. You need some experience to get it right. Finally, after three implementations we figured out the process and what was most critical about the instrument for us.’* This case suggests that ‘use matters’, i.e. the way the BSC is interpreted and used is key for successful BSC application. This raises the question of how a company should implement and use the BSC to increase organizational performance (see [Exhibit](#)).

**Exhibit.**

**Organizational impact of BSC implementation and use in a financial institution**

A large financial institution in the Netherlands decided to implement the BSC to increase organizational control. During the period 1996–2001 they made three attempts, all accompanied by management consultancies. The first two failed but the third implementation appears to have been successful. The following description illustrates that the way the BSC is interpreted and used matters. The way the BSC is used to complement corporate strategy and the way the BSC is operationalized to support comprehensive performance measurement appear key factors for successful implementation.

In 1996, the board of directors of the financial institution took the initiative for introducing and developing a scorecard on corporate level. The aim was to develop a coherent set of performance indicators linked to the firm’s strategy. With a moderator present, members of the board and the department heads participated in multiple sessions discussing several aspects of the new instrument. However, a very generally formulated mission statement made it difficult to come up with concrete strategic and operational indicators. Moreover it left room for conflicting interpretations based on different norms and values that arose. The board forced decisions and went ahead with top-down implementation. However, the ambiguity in strategic objectives and subsequent interpretations, combined with disagreement about performance indicators and targets, prevented scorecard success. People felt threatened further hindering the instrument’s success. Finally the project was abandoned. A merger and subsequent changes in the board of directors paved the way for a new attempt.

In 1998 the second BSC implementation was initialized by the accounting department business controller, who wanted to integrate the diverse accounting systems used by different departments. The same management consultancy as in the first attempt supported the implementation process. Top management support was present but no one from the board was really involved in the project. The effort thus was bottom up rather than top down. Probably as a consequence, the emphasis was on measurement system integration and improved reporting formats without taking the firm’s strategy as a starting point. To force a uniform scorecard structure, the controller decided to buy a stand-alone software package, a decision taken by mutual agreement within his own department. However this approach, which could be characterized as overly technically-oriented, did not involve the departments enough. As a result a ‘software based’ BSC was implemented, but most of the measurements proved of limited use. When the software turned out not to be user-friendly and incapable of being linked to the main information system, departmental resistance to the BSC-system grew. Finally, the project was abandoned and considered as sunk cost.

In 2000, after a second merger, the new board of directors decided to restructure the organization. Assisted by another management consultancy, the business processes were redesigned in order to create a more 'lean and mean' organization. With full support of the board, the BSC was introduced as the "change scorecard", i.e. the central organizing framework and communication mechanism to help guide the ongoing organizational change processes. The philosophy adopted was to create a 'cause and effect' mindset among employees to enhance continuous strategic learning. Workshops and frequent discussion meetings between the board of directors, the managers of the departments and team leaders were organized to facilitate implementation. The objectives of the meetings were multiple, including:

- discussion and clarification of the firm's strategy;
- making employees see the need for change;
- introduction of the new performance measurement and management system;
- involving staff at all levels of the organization, from strategic business unit to operational level.

To create a necessary change of culture and mindset, every employee had to apply for the newly designed positions, and this unsettled situation, which threatened job security and career prospects, clearly 'stimulated' change of behavior. Communication and training sessions helped everyone to develop the necessary competencies but also contributed to employee commitment, and showing early results was aimed at stimulating motivation. To involve the employees, they were included into empowered teams at different organizational levels, with each responsible for 'their' performance. They had to develop their own strategic objectives, that had to be linked explicitly to departmental and corporate strategy. Subsequently team performance measurement was based on criteria that were consistently derived from these strategic objectives. As a consequence, performance measurement and accountability became central issues. Teams and business units had to report two kinds of measures. First a set of joint measures applying to all teams and units, like budget variances and absence through illness. Second, a set of 4-8 specific performance measures (with a maximum of 15) related to the specific strategy objectives of the team or business unit. At local level the specific measures mostly appeared to be operational measures (e.g. the number of complaints, dropouts and process completion times), while at departmental level and top level these measures were more external oriented, e.g. financial performance measures compared to benchmarks, including sales, and percentage of market growth. Recording for information was done mostly with simple Excel data applications that were linked with the main system: 'Easy to Handle' was the slogan. The teams evaluated the relevance of the indicators regularly and if necessarily redefined them or introduced new indicators. The Planning and Control department supported these processes, making sure that the measures were coherent and consistent with clear links with the firm's strategic plans. In close consultation with the key team members, they discussed to what extent the indicators measured what they should measure and whether they reflected the teams' responsibilities. After 12 months an overall evaluation showed that the implementation was successful. 87% of the participants agreed that processes had become more focused and aligned and that management information had greatly improved. The more careful approach with strong top management and employee involvement had paid off. Increasingly the BSC was perceived as the 'changing change-scorecard'. Although the merger and reorganization context probably helped to make the necessary changes, the particular attention for strategy alignment of the scorecard and its effect on performance measurement appear to have been key factors for success.

This article’s aim is to contribute to understanding the effective use of the BSC by assessing how BSC use affects company performance. Such understanding is important, as knowing how to deal with the BSC effectively may help organizations to improve their competitive position and reach organizational objectives. Because there is little information present about how to optimize the tool’s benefits, it can provide managers with guidance as how to optimize the benefits of the BSC.<sup>6</sup>

The remainder of the article is organized as follows. First, empirical research on performance effects of BSC use is reviewed. Next, a research model and hypotheses are developed, followed by a description of the research method and a presentation and discussion of the results. Finally, we summarize our conclusions and discuss implications for managers.

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*Four perspectives were identified as critical. . . financial, customer, learning, and growth*

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**Theoretical background**

**Balanced scorecard**

In 1992 Kaplan and Norton argued that managers should not only focus on financial measures when taking decisions. Non-financial criteria also had to be taken into account. When integrated carefully and in a balanced manner in a “scorecard” it would provide managers with a brief but comprehensive and timely view of their business. Four different key perspectives were identified as being critical and thus should be included, i.e. the financial, customer, internal-business-process/learning, and growth perspectives. In 1996, the same authors extended their view stressing the importance of aligning the scorecard information with the business strategy. To translate the strategic goals efficiently into tangible objectives and measures, they suggested four interrelated management processes: clarifying and translating vision and strategy, communicating and linking strategic objectives and measures, business planning and target setting, and enhancing strategic feedback and learning. Finally, in 2001 Kaplan and Norton introduced five principles to keep strategy the focus of organizational management processes: translate the strategy into operational terms, align the organization to the strategy, make strategy everyone’s everyday job, make strategy a continual process, and mobilize change through executive leadership. Thus, in their work Kaplan and Norton gradually moved from (i) defining the BSC as a comprehensive performance measurement system to (ii) the BSC as a strategy implementation tool to facilitate and control performance measurement and management. These conceptual developments allowed that under the label ‘BSC’ tools of various interpretation and use exist.

**Review of empirical research on performance effects of the BSC**

Table 1 provides a brief overview of key studies that have examined performance effects of BSC use.<sup>7</sup> We have divided these studies into two types of research by classifying them along the two basic dimensions of use: the *level* of use and the *manner* of use (the *way* in which it is used). The level and manner of BSC use relate respectively to a firm’s *quantity* and *quality* of application of the instrument. The first type of research examines if the intensity of BSC use affects company performance. The assumption is that there is no variation in the manner of use. The second group of studies addresses the issue that under the label BSC different manners of interpretation and use are possible and focuses on the way in which the tool is used and its impact on performance.

The results of the first group of studies show positive and negative relationships between BSC use and performance. A possible explanation for these ambiguous and inconsistent find-

Table 1. Overview of studies regarding use of the BSC divided by dimensions of use

Dimension of BSC use	Authors	Topic/scope	Empirical evidence	Findings
Level of BSC use	Hoque and James (2000)	Relationship between BSC usage and company performance.	Survey of 66 Australian manufacturing companies	Greater BSC usage is associated with improved performance.
	Ittner, Larcker and Randall (2003)	Relationship between BSC use and measurement system satisfaction and financial performance.	Survey of 140 US financial services firms	BSC use is associated with higher measurement system satisfaction but not with improved accounting and stock market performance.
	Davis and Albright (2004)	Relationship between BSC implementation and financial performance of bank branches	Quasi-experimental study in US banking organization	Bank branches implementing the BSC outperform non-BSC implementing branches on key financial measures.
Manner of BSC use				
a) <i>Comprehensive performance measurement tool</i>	Lipe and Salterio (2002)	Context effect of organizing performance measures into the four BSC perspectives.	Experiment	The BSC perspectives have meaning to the decision-maker as they prime him or her to recognize potential relations among the measures within one category and to react to any perceived correlation.
	Olson and Slater, (2002)	Relationship between tailoring the BSC to the firm's strategic orientation and company performance.	Survey of 200 US services and manufacturing firms	The level of co-alignment of the BSC measures with strategy improves performance, suggesting that performance measurement should be tailored to strategic orientation. Depending on the strategy archetype, the BSC could be 'unbalanced' rather than balanced.
b) <i>Strategy implementation tool</i>	Malina and Selto (2001)	Effectivity of BSC as a strategy communication and management control device.	Case study in large international manufacturing company	BSC may intensify organizational focus to perform against strategic objectives. It helps to align actions to strategic objectives and to improve the quality of information for managerial decision making.

ings may be the lack of control in these studies for differences in the implementation and the actual way in which the instrument is used.

The second type of research confirms that there are serious differences in the way the BSC is or can be used. As a comprehensive performance measurement system the BSC affects the quality of information for decision making. When co-aligned carefully to corporate strategy it helps a company's strategic focus and increases performance.

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### *the quality or manner of BSC use is key*

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The findings suggest that the intensity or level of BSC use affects company performance but that the quality or manner of BSC use is key. To date, however, research on performance consequences of BSC use has generally focused on only one of these two dimensions rather than on both simultaneously. We now develop a model and hypotheses to further explore how BSC use affects organizational performance isolating the role and impact of both dimensions of use.

## **Research model and hypotheses**

We develop a model to test how BSC use affects company performance. The development takes place in the context of a *baseline model* that includes the relationships between strategy, environment, and company performance. Next, a *full model* is presented that also incorporates the effects of the BSC on company performance. We use this stepwise approach because it will help us calculate the impact of strategy on performance excluding and including BSC usage respectively. First, we briefly discuss the baseline model. We then turn to the different manners of BSC use and their specific effects.

### **Strategy–Environment–Performance: the baseline model**

There is a large body of literature regarding the effect of strategy and environment on company performance. Drawing on previous research, we define strategy as ‘the direction and scope of an organization over the long term, which achieves advantage for the organization through its configuration of resources within a changing environment to meet the needs of markets and to fulfil stakeholder expectations’.<sup>8</sup> The relationship between strategy and company financial performance is anticipated to be positive in accordance with the extant literature and research findings. Two other classical relationships are included, i.e. (a) product-market dynamics influence on company performance and (b) the interaction between strategy and product-market dynamics on performance. Market changes and evolution have been found to have a decaying effect on a company's competitive position, and thus constitute a negative influence on performance. However, this effect is less strong when the strategy is better aligned to the changing marketplace. A more contingent strategy will be more effective and make the organization's competencies more sustainable.

Utilizing this stream of past research, we conceptualize the baseline model of Strategy–Product-Market Dynamics–Performance as shown in [Figure 1](#). Consistent with the above, both direct effects of strategy and product-market dynamics as well as their interaction effect are present. As was noted, this model will be used as a baseline model to hypothesize and explore the effects of BSC use on performance.

### **Hypotheses regarding BSC use: the full model**

According to Kaplan and Norton (1992) a company's management has to monitor and manage company performance carefully using both financial and nonfinancial indicators. Their comprehensive measurement system offers a specific structure to measure these indicators. However, measurement without information dissemination to key decision-makers that act on it will not change operations and/or performance. Only the actual usage of information may

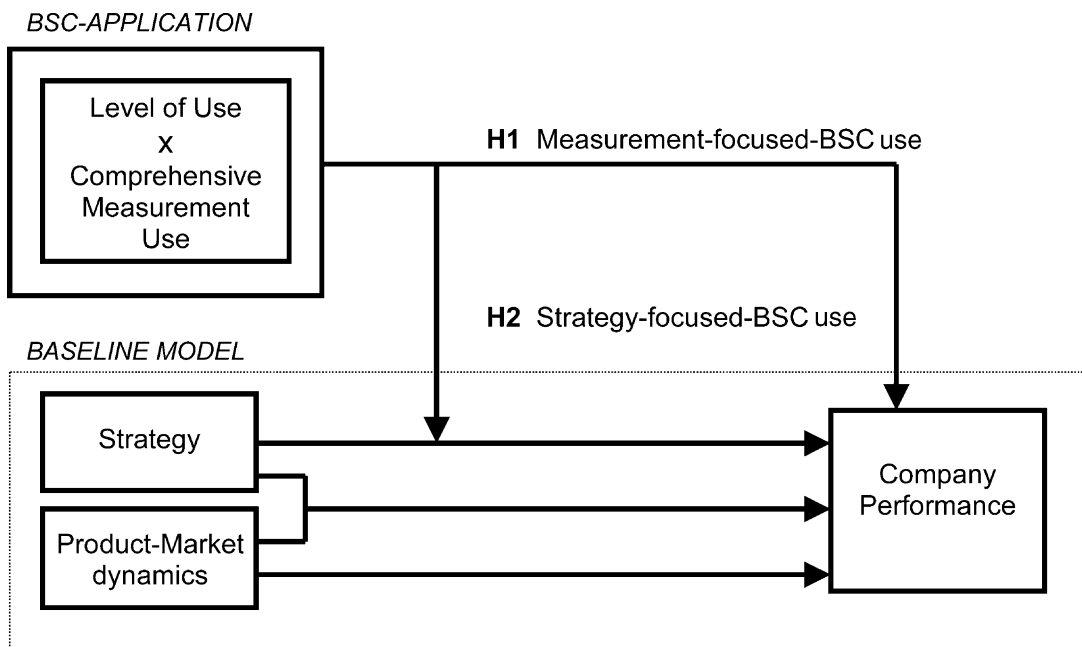


Figure 1. Model of using the BSC and company performance

have an effect. Poor measurement information combined with high usage will have a negative effect on the quality of management decisions. Good measurement and information will have the opposite and more desirable effect.<sup>9</sup> Based on this line of reasoning we define ‘measurement-focused-BSC use’ as the multiplication of the intensity or level of BSC use by the use of the BSC as comprehensive and balanced measurement system. Although we might argue a positive and negative effect based on ambiguous previous results we hypothesize a positive effect consistent with Kaplan and Norton (1992):

**H1.** *Measurement-focused-BSC use, i.e. the multiplication of the intensity or level of use by the usage of the BSC as a comprehensive performance measurement system, will be positively related to company performance*

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*.. measurement without information dissemination (those) that act on it will not change performance*

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Kaplan and Norton (1996 and 2001) argue that use of the BSC should help to put strategy to work. Management can formulate a strategy and implement it top down but will need good bottom up information to optimize it. Consequently, a good alignment between strategy and BSC use is a key for success. However, as our case example illustrates, this is an iterative learning process, involving identifying the right performance indicators and optimizing them in the light of results and experience. If this process works well BSC-usage will complement company strategy and make it more effective resulting in better company performance.<sup>10</sup> Thus, we define ‘strategy-focused-BSC use’ as the moderator effect of ‘measurement-focused-BSC use’ on company strategy. Therefore, consistent with Kaplan and Norton (1996 and 2001), we hypothesize the following relationship:

**H2.** *Strategy-focused-BSC use, i.e. the moderator effect of measurement-focused-BSC use on strategy, will be positively related to company performance.*

Methods

The model was tested in the Netherlands using a sample of 100 business-to-business companies taken from a database of companies which had responded to a benchmarking survey conducted by a major consultancy. We obtained 41 responses, representing a response rate of 41 percent. A brief sample profile is presented in Table 2.

Appendix A provides an overview of how the data were collected, constructs were made operational and data analyzed. All independent variables were measured using multiple items except “Comprehensive measurement use”. To measure the comprehensiveness and balance of the BSC measures, a simple formula was developed to identify to what extent information was measured in the four perspectives of the BSC. For the dependent variable we used several performance measures. It includes both an objective financial measure (the firm’s change in return on investment over the past three years) and a subjective nonfinancial measure (management’s overall assessment of the company’s performance). In addition we created and analyzed a combined performance measure by pooling these objective and subjective measures.<sup>11</sup> The data were analyzed using regression analysis. In accordance with our strategy of using a baseline model and complementing this with the use of the BSC, two sets of regression results were obtained and compared. The change in R<sup>2</sup> was examined to determine the additional effect of using the BSC. The limited sample size and the elementary way in which BSC use was operationalized may be considered as limitations of the study.

Results and discussion

Table 3 shows the results of the regression analysis for the hypothesized model shown in Figure 1. From the baseline model only strategy was significant ( $p < 0.05$ ) in all regressions. The full model explained 38% of variation of Overall Company Performance (adj.  $R^2 = 0.38$ ;  $F = 4.3$ ,  $df = 7$ ,  $p < 0.01$ ). A comparison with the outcome of the baseline model showed a substantial and significant positive increase in R<sup>2</sup> of 19% ( $\Delta R^2 = 0.19$ ,  $\Delta F = 2.8$ ,  $p < 0.05$ ), suggesting that BSC use contributes significantly to a company’s overall performance. The models using the other performance indicators were also significant and explained a fair amount of variance. The results explaining financial company performance were similar to those of overall company performance, although those regarding perceived company performance lagged behind. Moreover, the increase in R<sup>2</sup> from the BSC usage variables in this regression was not significant. An explanation may be response bias, i.e. less variation in the subjective performance evaluation than in the overall and objective performance measures.

Table 2. Profile of the Respondents (all numbers are in percentages)

Respondent’s function within company (%)		Number of years with company (%)		Industry (%)		Company Size	
						(fte)	(%)
Director business development	5.9	<2	11.8	Food	12.2	<250	56.1
Controller	32.3	2–5	35.2	Natural products	14.6	250–500	9.8
Assistant controller	17.7	6–10	11.8	Oil, gaz, chemicals	29.3	500–1000	21.9
Financial director	11.8	>10	41.2	Capital goods and others	43.9	>1000	12.2
Financial manager/head finance & accounting department	32.3						
Total	100.0		100.0		100.0		100.0



Table 3. Regression results for the impact of BSC usage on company performance

Dependent variables:	Overall Company Performance:		Financial Company Performance (change in ROI)		Perceived Company Performance	
	Beta	t-value	Beta	t-value	Beta	t-value
<i>Independent variables:</i>						
<i>Base line model Effects:</i>						
Constant		0.2		-0.3		0.3
Product-Market Dynamics	-0.20	-1.2	0.02	0.1	-0.36	-1.9
Strategy	0.77	4.9**	0.69	4.4**	0.59	3.4**
Product-Market Dynamics x Strategy	-0.11	-0.6	-0.29	-1.7	0.09	0.5
<i>BSC Usage Effects:</i>						
Measurement-Focused-BSC Use (H1)	-0.78	-2.6*	-0.68	-2.2*	-0.65	-1.9
Strategy-Focused-BSC Use (H2)	0.79	2.4*	0.59	1.8	0.74	2.1*
<i>Controls:</i>						
Level of Use	-0.28	-1.8	-0.35	-2.3*	-0.15	-0.9
Comprehensive Measurement Use	0.04	0.2	0.00	0.0	0.07	0.4
Overall Model Fit:	Adj. R <sup>2</sup> = 0.38	F = 4.3**	Adj. R <sup>2</sup> = 0.39	F = 4.4**	Adj. R <sup>2</sup> = 0.23	F = 2.7*
Increase in R <sup>2</sup> resulting from BSC Usage:	ΔR <sup>2</sup> = 0.19	ΔF = 2.8 (p < 0.05)	ΔR <sup>2</sup> = 0.20	ΔF = 3.1 (p < 0.05)	ΔR <sup>2</sup> = 0.11	(p < 0.28)

\*\*p < 0.01; \*p < 0.05.

On closer inspection of Table 3, zooming in on the model and using overall company performance as the dependent variable, we find that the effect of measurement-focused-BSC use was significant but negative. As this is opposite to our expectation, H<sub>1</sub> is rejected. The effect of strategy-focused-BSC use on overall company performance was significant and positive, providing support for H<sub>2</sub>. A similar pattern of effects was found regarding the other performance variables providing further support for our conclusions, although not all effects reached significance ( $p < 0.05$ ).

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*BSC use aligned to company strategy positively influences performance...the performance effect of measurement-focused-BSC use is negative*

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On the one hand, the results suggest that BSC use that is aligned to company strategy positively influences overall company performance, as was hypothesized. A comprehensive set of carefully chosen financial and non-financial measures may provide managers with insights to optimize their companies' strategy and to improve its competitive position and performance.<sup>12</sup> On the other hand, the performance effect of measurement-focused-BSC use is negative. Several explanations exist as to why this manner of BSC use decreases overall company performance. First, measurement applications may be too instrumental: specifically, when management sees implementation and usage of the BSC as an 'end' rather than a 'means' to a goal, performance may be harmed rather than helped. One respondent from the exhibit case commented: 'Initially, the focus was too much on making a dashboard. But, by looking only at the dashboard you cannot decide where you want to go'. When designed and used mechanistically, BSC use may result in overbureaucratization and focus on details rather than on the overall picture and strategic direction. A financial director who responded to the survey made the following comment: 'Because we experienced problems measuring 'soft information' elements, we shifted our attention towards searching for valid measures and reliable data but we lost sight of their strategic links.' A problem may be that in the beginning this ineffectiveness may not show because increases in efficiency measurements suggest improvement. However, efficiency and effectiveness results should be assessed and monitored together carefully. A methodological explanation as to why there is no support for H<sub>1</sub> may be the way BSC usage was operationalized. The negative effect of our two-way interaction could be an artifact of the assumption that an equal division of attention across the four BSC perspectives is optimal. Depending on the company's market and strategy archetype an 'unbalanced' but tuned-to-strategy BSC profile may be better than a standard 'balanced' BSC.<sup>13</sup> We checked different variation for comprehensiveness and balance using different formula but could not detect major changes in the two-way interaction's influence on performance. Finally, other managerial accounting tools may moderate or reinforce the relationships examined: for instance, the BSC may be incorporated into wider systems, e.g. Enterprise Resource Planning (ERP) systems.<sup>14</sup> The question is whether and when these tools become more effective and complement each other or work against each other. Future research may control for or study these effects.

### **Implications for managers**

This study contributes to understanding effective usage of the BSC. First, despite its promise, managers should be aware that BSC use does not automatically improve company performance. Under the label BSC different manners of interpretation and use are possible, each with serious pitfalls. This study emphasizes the importance of the strategy for BSC use. The results suggest that BSC use that complements corporate strategy will positively impact performance. However, mechanistic use without a clear link to corporate strategy will hinder performance and

may even decrease it. In other words, a focus on *performance measurement* instead of *performance management* will impede the realization of organizational objectives and may even prove counterproductive by hurting company performance. Thus BSC investments will only pay off if they are in line with strategy, and it is therefore important (i) to map how the BSC is used, and (ii) to evaluate whether BSC application facilitates and complements corporate strategy.

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*mechanistic use without a clear link to corporate strategy may even decrease performance*

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Second, the translation of vision and strategy into operational measures is a complicated and dynamic process. To structure this process Kaplan and Norton (1996:286) described an implementation program in which the BSC *'should be continually reviewed, assessed, and updated to reflect new competitive, market, and technological conditions'*. Our results confirm the need for continuous adaptation, although our case example also shows that this may be difficult to realize. Moreover, as one of our respondents mentioned: *'Although the BSC interpretation looked 'technically' correct, we noticed that its implementation was sometimes sabotaged and performance measures were consequently distorted. We gradually recognized that we had overlooked [the 'human side' of the matter, i.e.] social factors as key for successful BSC implementation. Transparent information proved to be a threat to some heads and departments.'* In other words, the introduction of the BSC may involve unanticipated dysfunctional consequences. People may feel threatened by the close monitoring system, leading to feelings of distrust towards company top management. To overcome these feelings, top management should engage in trust building behaviors, including taking the lead and endorsing openness, transparency and benevolence in the favor of overall company effectiveness and efficiency.<sup>15</sup>

Based on our findings we can now supplement Kaplan and Norton's 'roadmap' with some additional suggestions:

1. Use *multidisciplinary project teams* to help effective implementation of the BSC. It will create involvement from different functional areas, and may help create momentum particularly when people with a positive attitude towards adoption are selected. As our case example illustrates these teams should be actively supported and may best be *led by a top manager* rather than for instance an accounting department manager. This will confirm top management support, underline the strategic importance of the project and may help overcome resistance.
2. *Create a multidimensional and balanced baseline set of performance indicators*, and start measuring and monitoring. Use simple measures initially, and focus on the ones that are considered as key for organizational control and strategy.
3. *Introduce more unique measures* subsequently that better reflect the specific market and strategic conditions of the company or business unit in order to build a more tailored measurement system. This *fine-tuning* involves an *iterative process* and should be based on careful monitoring of initial BSC measurement effectiveness. *Careful validation* of the instrument's effectiveness in measuring firm efficiency and effectiveness is critical.
4. *A proactive stance is critical*. Top management should be alert to the dynamic environment of the firm affecting the fit between its strategy and the BSC. Changing contexts may require varying the set of indicators used and re-balancing the BSC-profile across the perspectives, rather than just fine-tuning the measurement system.

In conclusion, our results support managers' skepticism regarding the BSC. They warn against performance measurement orientation and call for focus on performance management. The Balanced Scorecard can enhance organizational performance, but managers should be careful

of the requirements for its implementation and use. These suggestions should assist managers in reaping full benefit from this interesting and potentially powerful management tool.

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## Appendix A

### Methods

#### Data collection and sample

The model was tested in the Netherlands using a sample of 100 business-to-business companies and a mail survey. The research was conducted in the spring of 2000 using for a sampling frame a database with companies that had participated in a benchmarking study of Cap Gemini Ernst & Young the year before. We ensured the respondents' competence before mailing our pre-tested questionnaire by conducting a telephone identification of suitable key informants. In total 80 companies agreed to participate. All firms received the questionnaire and a personalized cover letter, followed by a reminder-card sent two weeks later. We obtained 41 responses, which represents a response rate of 41 percent. A brief sample profile is presented in Table 2. Most informants were controllers and/or heads of the financial department of the company. Although there is a bias towards capital goods companies, the sample profile was consistent with the distribution of our sampling frame.

In spring 2002, the key respondents of our sample were contacted again. We asked them to provide additional information for our study. This additional information helped us to interpret the results better and understand more fully the relationship between BSC use and companies' performance over time. (All except two respondents, who had left their companies, co-operated. In order to obtain data about the performance of the two missing cases we contacted and obtained data from the respondents' replacement and company CEO, respectively.)

### Measures

All constructs were measured using multiple items and using a five-point rating scale ('strongly disagree'–'strongly agree'), except for the depend variable Company Performance and the independent variable Comprehensive Measurement Use.

*Company Performance* was made operational in three stages. First, we measured financial performance using the change in company Return On Investment (ROI, the ratio of net income to invested capital) over the three-year interval 1999–2001. It provided us with an estimate for long-term financial performance and company viability. Second, we had the respondent evaluate the company's perceived performance compared to the competition classifying it in the lowest to highest 20% of all sellers.<sup>16</sup> Third, we made a composite measure of the latter subjective and former financial performance measures. It was done using factor analysis (principal components analysis).

*Product-Market Dynamics* was measured utilizing four items.<sup>17</sup> Respondents evaluated the need for changes in their company's marketing due to competitor actions, the level of technological change causing their products to become obsolete, and difficulty in predicting future customer demand and competitor behavior.

*Strategy* was made operational focusing on product innovation strategy. Product innovation has been acknowledged as the main driver of organizational renewal of resources and is also a 'root dimension' of many strategy configurations.<sup>18</sup> A 4-item measure was used referring to different levels and aspects of new product development, including time to market.

*Level of BSC use* was also operationalized using 4 items. The items were preceded by a definition of the BSC taken from Kaplan and Norton (1996). This definition focused on the BSC as an elaborate framework of financial and nonfinancial performance measurement. This approach helped to synchronize the terminology between respondents. The items used measured both the level of awareness and use of the BSC.<sup>19</sup>

To make *Comprehensive measurement use* operational, a simple formula was developed to identify to what extent information was measured in the four perspectives of the BSC, i.e. financial, customer, internal processes, and learning/growth. To establish the focus of the financial and nonfinancial performance measures used by the company, respondents were asked to divide 100 points between these perspectives. Next, BSC use as a comprehensive measurement tool was calculated utilizing the following formula:  $(100 - \sum_{i=1}^4 |Score(i) - 25|)$ . A high score reflects a situation where all four aspects are equally taken into accounting ( $score = +100$ ), suggesting comprehensive measurement, whereas a low score indicates an extremely unbalanced use with 100 percent focus on a single perspective ( $score = -50$ ). The assumption thus is that an equal allocation of attention over the different perspectives is most optimal (Kaplan and Norton 1992, 1996) and resembles a high general level of BSC usage as comprehensive measurement tool.

*Measurement-focused-BSC use* and *Strategy-focused-BSC use* were made operational as the multiplication of the level of BSC use and comprehensive measurement use, and the moderator effect of measurement-focused-BSC use on strategy respectively. The potential problems of multicollinearity that might arise from including the interaction effects were addressed by utilizing a 'mean centering' approach.<sup>20</sup> Following this approach the individual measures were standardized before developing the interaction terms.

*Control variables.* In addition to the study constructs mentioned above some background information about the respondent and the company was also collected (e.g. company size (number of employees) and industry type).

## Analysis

The data were analyzed in two stages using SPSS 11.0. First, for measurement validation we used conventional methods such as coefficient alpha, item-to-total correlation, and exploratory factor analysis.<sup>21</sup> The reliability of all multiple item constructs ranged from 0.66 for the combined performance measure to 0.78 for strategy, indicating acceptable internal levels of consistency. Second, we used hierarchical regression analysis to test the model. All VIF-scores in the regression analysis, including those for the interactions, were below 1.8, confirming that collinearity was not a problem. Based on the small sample size the significance level was restricted to 95% when interpreting the results. In accordance with our strategy of using a baseline model and comparing it with the full model that includes the BSC-use variables and interactions, for the dependent variables, two sets of regression results were obtained and compared. The change in  $R^2$  was used to determine the additional effect of the BSC-use variables.

In the original analysis several control variables were included, e.g., company size (number of employees) and industry type. They proved to be not significant in explaining performance ( $p > 0.17$ ). As a result and to keep the model parsimonious they were deleted from the final analysis.<sup>22</sup>

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