

Performance driven behavior as the key to better organizational performance

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Abstract: An increasing number of profit and non-profit organizations are implementing new and alternative management control systems, like the balanced scorecard, critical success factors and key performance indicators, in order to obtain better organizational results. Despite the increase in experience gained with this approach, there is still a lot to be learned about the factors that influence the everyday use of management control systems and of the factors that influence performance-driven behavior. Recent research states that both the instrumental and the behavioral dimensions of management control have equal influence on this behavior. To test this statement, these dimensions have been operationalized in an analysis tool called the performance management analysis (PMA). In this article the results of research into the relation between the instrumental and the behavioral dimensions and organizational performance are discussed. Based on 577 PMAs, the research results show that paying (equal) attention to instrumental and behavioral dimensions indeed results in higher competitive performance.¹

Keywords: *management control, behavior, performance management, performance-orientation, organizational results, competitive environment, competitive performance*

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Introduction

Management control systems are defined as ‘the formal, information-based routines and procedures managers use to maintain or alter patterns in organizational activities’ (Simons 2000). These systems focus on conveying financial and non-financial information that influence decision making and managerial action. An increasing number of profit and non-profit organizations are implementing management control systems, often in the shape of performance management systems such as the Balanced Scorecard, in order to obtain better organizational results (Azofra et al. 2003; Propper and Wilson 2003; Said et al. 2003; Bititci et al. 2004; Davis and Albright 2004; Epstein et al, 2004; Marr et al, 2004; Robinson 2004). According to Neely (2000), there is a natural evolutionary cycle at work in the development of theory and practice in the field of management control. During this cycle, managers were first concerned that they were measuring the wrong things (late 1980s and early 1990s). After struggling with the adoption of new and alternative measurement systems, like the balanced scorecard (BSC), critical success factors (CSFs) and key performance indicators (KPIs) (throughout the 1990s), they now turn to the question of how to use the data provided by these new systems in their management activities (late 1990s and early 2000s).

The answer to this question may very well found with the management control system users themselves. Beer (1997) comments in this respect: “Implementation of technical or structural solutions depends on organizational and human factors that the research and theory did not incorporate. Few management scholars specify the conditions and processes managers might use to implement their theories, concepts and methods.” Van Egten (1996) states that management styles, like knowledge, skills, and individual motives and experiences, are important to the use of management information. Zairi (1994) goes even further when he states that at the heart of the problem of performance measurement lays the human element. Ashton (1997) quotes the American Productivity & Quality Center’s International Benchmarking Clearinghouse: “People issues appear to be ‘make or break’ factors in success – deliberate, targeted and ongoing communication strategies are crucial, along with education and reinforcing a central question: how does individual effort relate and contribute to business strategy?” Simons (2000) states that management control systems cannot be designed without taking into account human behavior, and Holloway et al. (1995) remark that the successful

implementation of performance measurement approaches depends on understanding and accommodating the human element in management control.

Special attention then should be paid to the behavioral aspects surrounding the use of management control systems (Gelderman 1998; Wiersma 1998; Williams 1998, Vosselman 1999; Otley 2003; Garengo and Bititci 2004). The term 'behavioral aspects' is used here twofold: (1) for activities of organizational members that can be observed, and (2) for preconditions that allow organizational members to display performance-driven behavior (Waal, 2002). Unfortunately, there are not many concrete examples in the literature of the influence of behavioral aspects on the use of a management control system (Jones 1999; Krause 2000; Vagneur and Peiperl 2000). A reason for this lack may be, as Kloot (1997) states, the influence of the widely adopted definition of management control of Anthony (1965). Kloot remarks that although Anthony specifically suggested that the study of control should be broadly based in the behavioral sciences, his work showed little evidence of borrowing from behavioral sciences. Consequently, control has popularly taken on the connotation of accounting control and the study of control systems has become overly narrow by remaining primarily focused on accounting control mechanisms (Otley 1994). Another reason, according to Pfeffer and Sutton (2000), is that many organizations still operate using an oversimplified or incorrect model of human behavior that has become institutionalized in certain types of management control systems. These models have become a signal of competent management and are so widely diffused that firms are reluctant not to follow them. However, most authors who mention the importance of behavioral aspects are of the opinion that addressing these factors is crucial and beneficial for a successful implementation and use of a management control system (Holloway et al. 1995; Van Egten 1996; Brookfield 2000; Simons 2000; Franco and Bourne 2002; Chenhall 2004; Bassioni et al. 2004; Robson 2004). On top of this, research shows that the combination of performance-driven behavior and regular use of the management control system leads to improved results (Hoque and James 2000; Ahn 2001; Sandt et al. 2001; Waal 2002, 2003; Bauer et al. 2004; Malina and Selto 2004). It therefore makes sense to test if the combination of instrumental and behavioral aspects *in practice* positively

influences the behavior of people and the use of management control systems, and consequently the performance of an organization.

Theoretical model

To study the influence of instrumental and behavioral aspects, a management control model is needed that incorporates both types of aspects. Such a model can be found in Simons' four levers of control (Simons, 1995). This model has been regularly used in the management control literature because, in the words of Bruining et al. (2004), "Simon's model of the dynamic relationships between management control systems and strategic change is an attempt to offer a coherent and comprehensive body of management control theory." The distinguishing features of Simon's four levers of control model are depicted in Figure 1. The levers are:

- *Beliefs systems* – These systems give direction to the organization by formulating its mission, strategy and core values. These systems consist of a set of organizational definitions which are formulated, formally communicated and frequently reconfirmed by senior management to provide values, purpose and direction to the organization. Beliefs systems are used to inspire and direct the search for new opportunities. This type of system can be denoted as behavioral.
- *Boundary systems* – These systems indicate the risks to be avoided and the actions which organizational members are expected not to take. They provide sets of working arrangements, codes of conduct and rules and procedures. Boundary systems are used to set limits on opportunity-seeking behavior. This type of system can be denoted as instrumental.
- *Diagnostic control systems* – These systems measure and monitor the execution of the mission and strategy with predefined performance indicators. On the basis of the feedback and feed forward information provided by these systems, managers take corrective and preventive actions to keep the organization on track. These systems also foster the achievement of predefined targets by using rewards. Diagnostic control systems are used to motivate, monitor and reward achievement of specified goals. This type of system can be denoted as both instrumental and behavioral.
- *Interactive control systems* – These systems are formal communication systems that managers use to involve themselves in activities of employees and employees use to

communicate bottom-up ideas and initiatives. These systems foster dialogue between the various organizational levels. Interactive control systems are used to stimulate organizational learning and the emergence of new ideas and strategies. This type of system can be denoted as behavioral.

INSERT FIGURE 1 HERE

As Simons states (1995, pp.4-5), for an organization to effectively achieve its strategy the instrumental design of the management control system and the way managers use that system are equally important, and consequently all four types of systems should be present in the organization. In order to operationalize the levers of control, a literature study was undertaken to identify the instrumental and behavioral aspects which make up the four levers. This study yielded nine dimensions. The instrumental dimensions of a management control system are discussed briefly, because they are dealt with extensively in current management control literature. The focus is on the discussion of the behavioral dimensions of an organization's management control system (Simons 1995, 2000; Kaplan and Norton 1996; Merchant 1998; Neely 1998, 2000; Lipe and Salterio 2000; Malina and Selto 2000; Marchand et al. 2000; Waal 2001, 2003; Bauer et al. 2004). The relation between the dimensions and the levers of control is depicted in Figure 1.

Instrumental dimensions: responsibility structure, content, integrity, manageability

The organization needs to have a clear and formalized *responsibility structure*, in which a clear parenting style and clear tasks and responsibilities have been defined. These are then applied consistently at all management levels. The management control system has a *content* which enable organizational members to use financial and non-financial performance information. This information has a strategic focus through the use of critical success factors and key performance indicators. The performance information is *integer* which means it is reliable, timely and consistent. It is also *manageable*: management reports and management control systems are user-friendly and more detailed performance information is easily accessible through information and communication technology systems. Finally, other management systems in the

organization, such as the human resources management system, are well *aligned* with the management control system, so what is important to the organization is regularly evaluated and rewarded.

Behavioral dimension: accountability

The effectiveness of the performance management system is determined by the degree in which organizational members actually feel responsible for their results and their willingness to use the system to obtain performance information which may help to improve the results. A noncommittal organizational climate is a real threat for the desired performance-orientation of an organization. The degree in which one feels responsible is expressly different from the degree in which one is made responsible. To stimulate feelings of responsibility, an organization has to take two elements into consideration: relevance of controls and freedom to act.

The degree in which organizational members feel responsible for their results is connected to the relevance of the performance indicators which measure their responsibility area. The more relevant these indicators are in the opinion of the organizational members, the stronger the stimulus will be for them to get involved themselves. For example, an operational manager will generally not be stimulated to take action when the results of the overall company are lagging. However, when it is made clear to him that the lagging results of his own unit are the cause of this, he will be strongly motivated to take responsibility and work on improving the results. It shows that the defined CSFs and KPIs have to be evaluated regularly on their relevancy for control purposes by asking the question: Do they still give an accurate picture of the performance of a manager's responsibility area and its link with overall organizational performance? After all, there may have been many internal and external changes since the indicators were originally formulated and the content of the performance information may thus no longer be representative.

Taking responsibility for results requires that organizational members are given a certain leeway so that they have the opportunity to influence their results favorably and the freedom to take action. This implies that people have to be authorized by their managers to take independently and swiftly action on problems without having to ask

permission first. It also asks for involvement of organizational members in defining the right KPIs for their responsibility areas.

Behavioral dimension: management style

A manager with an effective style is able to explicitly steer on results while simultaneously giving support to employees to help them in obtaining the desired results. Steering entails making clear agreements, monitoring, discussing progress issues and calling upon the own responsibility of employees. Support asks for a coaching management style which is aimed at enlarging people's insight into their possibilities for influencing their own results and at stimulating their feelings of responsibility. When the management style is restricted to only steering, a directive style without much regard for the importance of individual responsibility will be the result. However, when the management style is limited to only supporting and coaching, decreased commitment and disorientation will be the result. The combination of result-oriented steering and coaching equals the style of 'result-oriented coaching'. To stimulate this management style, an organization has to take three elements into consideration: visible commitment, clear steering and support.

Visible commitment entails that management uses the performance management system in such a way that it is clear and visible to the other members of the organization. Visible commitment goes far beyond pronounced commitment. It is about visible behavior and conduct with which a manager shows to employees that he is genuinely committed. In a formal context managers show commitment by using performance information during management team meetings and departmental meetings to discuss progress, problems and improvements. Managers show commitment in an informal context by regularly expressing real interest in the advancements of employees and the progress of their improvement actions, and by investing time in visibly obtaining good results. The exemplary role model of management is essential. Only when management continuously shows it takes performance information seriously and bases its actions on it, will organizational members be enticed to also dedicate themselves to obtaining the desired results.

To focus the attention of organizational members maximally on the desired performance, forceful steering by management is necessary. Forceful steering is

characterized by setting clear goals, drafting clear improvement plans, monitoring progress in a disciplined way and swiftly formulating additional corrective actions if necessary. To prevent a noncommittal attitude, the manager has to confront employees on lagging results and their accountability for this. In addition, the manager should also notice and publicly acknowledge improvements made by his employees.

While steering is primarily focused on increasing accountability, support is aimed at stimulating the sense of individual responsibility of organizational members. Unilaterally imposing goals and targets and point-blank confronting people with lagging results will normally not stimulate and increase their sense of own responsibility. The latter asks for a coaching style, aimed at letting organizational members think about their own opportunities for influencing results favorably. This entails, for instance, involvement of members during the formulation of their goals and targets. It is of importance to entice members, during progress meetings, to think about which of their behaviors may have caused certain results and about how they themselves can improve these results. This requires phrasing questions in a different way than the traditional rational one ('What is the reason for these bad results?') because that stimulates organizational members to look for excuses in the external environment or to shift the blame to others.

Behavioral dimension: action orientation

Action orientation is the degree in which performance information actually stimulates action-taking to improve performance. Action orientation is a good predictor of the effectiveness with which performance management is being applied. After all, if performance information does not lead to action, the added value of this information will be nil. To stimulate action orientation, an organization has to take three elements into consideration: integration, corrective action management and preventative action management.

Integration is the degree in which performance information is integrated in daily operational management. When there is good integration, performance information is regarded by organizational members as indispensable for their being able to do their 'regular job' effectively. This means that information is the main basis for decision-

making. The management reporting set contains standard exception, analysis and action reports and is always discussed during management team meetings and departmental meetings.

Corrective action management entails organizational members taking immediate action on lagging results in order to influence these results favorably. This asks for consistently and continuously making transparent how the organization is performing, regularly monitoring progress and always analyzing how performance can be improved. In addition, it has to be clear to organizational members what corrective actions have to be taken and who is responsible for these actions. Finally, a consistent evaluation has to be made of the results of the corrective actions.

Preventative action management entails organizational members taking preventive action on unfavorable prognosis in order to prevent problems from actually occurring. An important tool in this respect is the rolling forecast which looks four to six quarters ahead at expected results. As is the case with corrective action management, organizational members need clear insight into which preventive actions have to be taken and who is responsible for these actions. The results of the preventive actions also have to be evaluated. By having a standard analysis and action reporting set at their disposal, organizational members are abreast of progress and results of the preventive actions. Discussion of the rolling forecasts does not focus on the reasons for expected lagging results but on the quality of the prognosis and preventive actions and whether additional action-taking is needed.

Behavioral dimension: communication

Effective performance management requires optimal communication about: the direction (strategy) of the organization, the boundaries between which organizational members are allowed to operate independently, the results to be achieved, the results which have been achieved, and the lessons learned. Communication and alignment are needed for organizational members with the same frame of reference in respect to performance information, so that everybody in the organization interprets this information in the same way. To stimulate communication, an organization has to take three elements into consideration: top-down communication, bottom-up communication and horizontal information exchange.

Top-down communication consists of two sub-elements: feed forward and feedback. During feed forward, top management sets a clear common direction for the company by communicating the strategy, organizational priorities and results to be achieved. In this way, organizational members know which way the organization is going and can they experience a sense of belonging. During feedback, top management gives a clear picture to all organizational members about the overall consolidated results of the company and the results of the individual organizational units. As a result, organizational members know the status of their organization and they can again feel committed to it. Bottom-up communication also consists of the sub-elements feed forward and feedback. During feed forward, lower organizational levels structurally provide top management with planning information, so management can base its strategy on a strong foundation. Besides, incorporating this lower level information increases the support base for the strategy. During feedback, lower organizational levels structurally provide top management with information on the results achieved by them, so a clear picture of the company's status emerges. Both top-down and bottom-up communication requires a well-designed communication structure which is aligned with existing consultative bodies, so no inefficient overlaps occur. An important precondition for effective communication is a positive culture which is not aimed at punishing bad results but at continuous improvement. In such a culture organizational members most certainly are confronted with their results but in a positive way which is aimed at discussing how to improve these results.

Regular horizontal information exchange between organizational units of performance information leads to increased insight into the overall performance of the company and of the own role of the unit in obtaining this result. Further exchanging information about problems, solutions and lessons learned stimulates the overall quality of the company and fosters performance-driven behavior. A culture is needed that not only stimulates information exchange but also rewards it.

Testing the instrumental and behavioral dimensions

An analytical tool – the performance management analysis (PMA) – was developed to test the instrumental and behavioral dimensions (see appendix). With the PMA an

organization can score itself on both instrumental and behavioral dimensions, using a questionnaire, to evaluate the degree of its result-orientation (Waal 2004). In the analysis, the nine dimensions are valued on a scale of 1 to 10. The more attention an organization pays to elements belonging to a certain dimension, the higher it will score on that dimension. The use of this kind of continuous scale has become common practice in the social sciences (Kaynak and Hartley 2005). In addition to scoring the organization along the nine dimensions, the relative competitive performance is identified. This is done by asking the respondents to compare their organization's performance to that of its competitors or organizations with similar services (in case of public sector organizations) and calculating its position on a scale from 1 to 10. Such self assessment of performance is generally accepted as a reliable tool to measure the performance of an organization (Dollinger and Golden, 1992; Glaister 1998; Dawes 1999; Heap and Bolton, 2004; Marr 2004; Wall, et al., 2004; Devinney et al., 2005). Finally, the respondents characterize the external environment in which their organizations operate.

During the period January 2002 – March 2006 data were obtained by distributing PMA questionnaires worldwide to students of MBA courses, participants of seminars, and workshops held with companies. These events were conducted by the author and colleagues and were both on performance management and other topics. In this way, a random sample was obtained because most respondents to the questionnaire were not specifically interested in management control. In total 577 questionnaires (one questionnaire per organization), of organizations world-wide from a broad range of industries (both profit and non-profit), were collected and coded in a database. Table 1 gives descriptive statistics for the database.

INSERT TABLE 1 HERE

To test whether Simons' statement is valid that both the instrumental side (structure and content of the management control system) and the behavioral side (the way the system is used by organizational members) are equally important, a principal component analysis of the nine dimensions was conducted. Figure 2 shows the scree plot. The first

principal component explains 63.7 percent of the variance, and all dimensions load between 0.7 and 0.87. These results indicate that it is feasible and reasonable to construct a single aggregate factor based on the nine dimensions (Mendelson and Pillai, 1999). This factor is called ‘performance driven behavior’ (PDB) and is used to describe the set of instrumental and behavioral dimensions an organization needs to pay attention to, in order to become successful.

INSERT FIGURE 2 HERE

Subsequentially, the nine dimensions were related to the competitive performance of organizations. Table 2 shows that all dimensions show a correlation with performance, indicating that – as Simons stated (Widener 2005) – the combination of all nine instrumental and behavioral dimensions *in practice* positively influence the performance of an organization.

INSERT TABLE 2 HERE

To test whether a distinction can be made between the instrumental and behavioral dimensions, a ‘forced’ two factor principal component analysis with rotation was conducted. The two principal components now explain 71.4 percent of the variance. Table 3 shows that the dimension content loads almost equally high on both the instrumental and behavior factors, indicating that performance information (in the form of CSFs and KPIs) is indeed the ‘foundation of management control’ (Waal, 2002).

INSERT TABLE 3 HERE

A logical assumption is that low performance organizations score less on the nine dimensions and might show less balance between the instrumental and behavioral dimensions than high performance organizations. To test this assumption, the organizations in the sample were divided into three subsets: (1) Low Performance - scores on competitive performance less than 4; (2) Medium Performance - scores on competitive performance between 4 and 7; and (3) High Performance - scores on

competitive performance more than 7. The ANOVA-analysis in Table 4 shows that seven of the nine dimensions indeed demonstrate significant differences between the subsets.

INSERT TABLE 4 HERE

The descriptive statistics in Table 5 also show the differences between the three subsets.

INSERT TABLE 5 HERE

Conclusion

The research described in this article has some limitations. First, the respondents of the questionnaire may have scored their own company more favorably than an outsider, thus more objective researcher, would have done. Secondly, it is possible that there are other aspects of importance to performance-driven behavior, which have not been included in the PDB factor. Despite these limitations, the research results provide a first indication of the importance of combining instrumental and behavioral dimensions to create a successful performance-driven organization that achieves sustained better results. These results are strong, unequivocal and apply to all dimensions studied. Further research opportunities are to investigate whether there are difference between industries (profit versus non-profit), company sizes and countries where organizations originate.

In conclusion, it can be stated that there is a clear and strong relation between organizational performance and the attention given to management control. This attention should be balanced, i.e. both the instrumental and the behavioral dimensions of management control should be simultaneously improved. It seems to pay for organizations to not only improve their management control systems but to do this in an equal balance for both the instrumental and behavioral dimensions, in order to improve the overall performance of the organization. This study aimed to identify which instrumental and behavioral dimensions an organization has to focus on, and the extent of this focus, in order to achieve sustainable performance. As these dimensions have

until now not been identified as an integral set, this identification is the contribution to the literature.

References

- Ahn, H. 2001. Applying the balanced scorecard concept: an experience report. *Long Range Planning* 34: 441-461.
- Anthony, R.N. 1965. *Planning and control systems: a framework for analysis*. Harvard Business School Press, Boston
- Ashton, C. 1997. *Strategic Performance Measurement, transforming corporate performance by measuring and managing the drivers of business success*. Business Intelligence, London
- Azofra, V., B. Prieto and A. Santidrián. 2003. The usefulness of a performance measurement system in the daily life of an organization: a note on a case study. *British Accounting Review* 35: 367-384
- Bassioni, H.A., A.D.F. Price, and T.M. Hassan. 2004. Performance measurement in construction. *Journal of Management in Engineering* (April): 42-50
- Bauer, J., S.J. Tanner, and A. Neely. 2004. Benchmarking performance measurement, a consortium benchmarking study. In: *Performance measurement and management: public and private*, edited by A. Neely, M. Kennerly, and A. Waters, Centre for Business Performance, Cranfield University, Cranfield: 1021-1028
- Beer, M. 1997. *Why management research findings are unimplementable: an action science perspective*. Working paper, Harvard University, 1997. Quoted in: R.S. Kaplan. 1998. Innovation action research: creating new management theory and practice. *Journal of Management Accounting Research* 10: 89-118.
- Bititci, U., K. Mendibil, S. Nudurupati, T. Turner, and P. Garengo. 2004. The interplay between performance measurement, organizational culture and management styles. In: *Performance measurement and management: public and private*, edited by A. Neely, M. Kennerly, and A. Waters, Centre for Business Performance, Cranfield University, Cranfield:107-114.
- Brookfield, D. 2000. Management styles in the public sector. *Management Decision*, 38, 1:13-18
- Bruining, H., M. Bonnet and M. Wright. 2004. Management control systems and strategy change in buyouts. *Management Accounting Research*, 15, 2: 155-177
- Chenhall, R.H. 2004. The role of cognitive and affective conflict in early implementation of activity-based cost management. *Behavioral research in Accounting* 16: 19-44
- Davis, S., and T. Albright. 2004. An investigation of the effect of balanced scorecard implementation on financial performance. *Management Accounting Research* 15: 135-153

- Dawes, J. 1999. The relationship between subjective and objective company performance measures in market orientation research: further empirical evidence. *Marketing Bulletin* (May) 10: 65-76
- Devinney, T.M., P.J. Richard, G.S. Yip, and G. Johnson (2005), *Measuring organizational performance in management research: a synthesis of measurement challenges and approaches*. Research paper, www.aimresearch.org
- Dollinger, M.J., and Golden, P.A. 1992. Interorganizational and collective strategies in small firms: environmental effects and performance. *Journal of Management*, vol. 18, no. 4: 695-715
- Egten, C.A. van. 1996. Een model voor de beoordeling van de kwaliteit van bestuurlijke informatie in een organisatie' [transl. 'A model for the evaluation of the quality of management information in an organization']. *Handboek Accountancy* (March) E1250: 1-22.
- Epstein, M.J., A. Rejc, and S. Slapnicar. 2004. The impact of performance measurement on corporate financial performance. In: *Performance measurement and management: public and private*, edited by A. Neely, M. Kennerly, and A. Waters, Centre for Business Performance, Cranfield University, Cranfield: 339-346
- Franco, M., and M. Bourne. 2002. *Factors that play a role in 'managing through measures'*. Working paper (December), Centre for Business Performance, Cranfield School of Management
- Garengo, P., and U.S. Bititci. 2004. Performance measurement in small and medium enterprises: an empirical study in Scottish companies. In: *Performance measurement and management: public and private*, edited by A. Neely, M. Kennerly, and A. Waters, Centre for Business Performance, Cranfield University, Cranfield: 419-426
- Gelderman, M. 1998. The relation between user satisfaction, usage of information systems and performance. *Information & Management* 34: 11-18
- Glaister, K.W. 1998. Measures of performance in UK international alliances. *Organization Studies* (Winter)
- Groot, T.L.C.M. 2004. *Environmental uncertainty, corporate strategy, performance measurement and the creation of economic value*. Working paper, Vrije Universiteit Amsterdam
- Heap, J., and M. Bolton. 2004. Using perceptions of performance to drive business improvement. In: *Performance measurement and management: public and private*, edited by A. Neely, M. Kennerly, and A. Waters, Centre for Business Performance, Cranfield University, Cranfield: 1085-1090.

- Holloway, J., J. Lewis, and G. Mallory, eds. 1995. *Performance measurement and evaluation*. Sage Publications, London
- Hoque, Z., and W. James. 2000. Linking balanced scorecard measures to size and market factors: impact on organizational performance. *Journal of Management Accounting Research* 12: 1
- Jones, N. 1999. *Performance management in the twenty-first century, solutions for business, education and family*. St. Lucie Press, Boca Raton
- Kaplan, R. S., and D.P. Norton. 1996. *The balanced scorecard, translating strategy into action*. Harvard Business School Press, Boston, Mass.
- Kaynak, H., and J.L. Hartley. 2005. Exploring quality management practices and high tech firm performance. *Journal of High Technology Management Research*, 16: 255-272
- Kennerley, M., and A. Neely. 2002. A framework of the factors affecting the evolution of performance measurement systems. *International Journal of Operations & Production Management* (22) 11: 1222-1245
- Kloot, L. 1997. Organizational learning and management control systems: responding to environmental change. *Management Accounting Research* 8: 47-73
- Krause, O. 2000. Management knowledge engineering – a toolkit to engineer adaptive management systems. In: *Performance measurement – past, present, and future*, edited by A. Neely, Centre for Business Performance, Cranfield University, Cranfield: 307-314
- Lipe, M.G., and S.E. Salterio. 2000. The balanced scorecard: judgmental effects of common and unique performance measures. *Accounting Review* (75) 3: 283-298
- Malina, M.A., and F.M. Selto. 2000. *Communicating and controlling strategy: an empirical study of the effectiveness of the balanced scorecard*. Paper presented at the AAA Annual Conference, Philadelphia, August 13-16
- Malina, M.A., and F.M. Selto. 2004. *Choice and change of measures in performance measurement models*. Working paper (June). Naval Postgraduate School/University of Colorado
- Marchand, D.A., T.H. Davenport, and T. Dickson, eds. 2000. *Mastering information management, complete MBA companion in information management*. Prentice Hall Financial Times, Harlow.
- Marr, B. 2004. *Business performance management: current state of the art*. Cranfield University School of Management & Hyperion
- Marr, B., A. Neely, M. Bourne, M. Franco, M. Wilcox, C. Adams, S. Mason, and M. Kennerley. 2004. Business performance measurement – What is the state of use in large US firms. In: *Performance measurement and management: public and private*, edited by A. Neely, M.

- Kennerly, and A. Waters, Centre for Business Performance, Cranfield University, Cranfield: 627-634
- Mendelson, M., and R.R. Pillai. 1999. Information age organizations, dynamics and performance. *Journal of Economic Behavior & Organization*, 38: 253-281
- Merchant, K.A. 1998. *Modern management control systems: text & cases*. Prentice Hall, Upper Saddle River, NJ
- Neely, A. 1998. *Measuring business performance, why, what and how*. The Economist Books, London
- Neely, A., ed. 2000. *Performance measurement – past, present, and future*. Centre for Business Performance, Cranfield University, Cranfield
- Otley, D. 1994. Management control in contemporary organizations: towards a wider framework. *Management Accounting Research* 5: 289–299
- Otley, D. 2003. Management control and performance management: whence and whither? *British Accounting Review* 35: 309–326
- Pfeffer, J., and R.I. Sutton. 2000. *The knowing-doing gap, how smart companies turn knowledge into action*. Harvard Business School Press, Boston
- Propper, C., and D. Wilson. 2003. *The use and usefulness of performance measures in the public sector*. CMPO Working Paper Series, no. 03/073 (May)
- Robinson, P. 2004. The adoption of the balanced scorecard: performance measurement motives, measures and impact. In: *Performance measurement and management: public and private*, edited by A. Neely, M. Kennerly, and A. Waters, Centre for Business Performance, Cranfield University, Cranfield: 883-890
- Robson, I. 2004. Implementing a performance measurement system capable of creating a culture of high performance. In: *Performance measurement and management: public and private*, edited by A. Neely, M. Kennerly, and A. Waters, Centre for Business Performance, Cranfield University, Cranfield: 1189-1196.
- Said, A.A., H.R. HassabElnaby, and B. Wier. 2003. An empirical investigation of the performance consequences of nonfinancial measures. *Journal of Management Accounting Research* 15: 193-223
- Sandt, J., U. Schaeffer, and J. Weber. 2001. *Balanced performance measurement systems and manager satisfaction*. Otto Beisheim Graduate School of Management.
- Simons, R. 1995. *Levers of control, how managers use innovative control systems to drive strategic renewal* Harvard Business School Press, Boston, Mass.
- Simons, R. 2000. *Performance measurement and control systems for implementing strategy: text & cases*. Prentice Hall, Upper Saddle River, NJ.

- Sunder, S. 2002. Management control, expectations, common knowledge, and culture. *Journal of Management Accounting Research* 14: 173-187
- Tapinos, E., R.G. Dyson, and M. Meadows. 2004. The impact of performance measurement in strategic/corporate planning. In: *Performance measurement and management: public and private*, edited by A. Neely, M. Kennerly, and A. Waters, Centre for Business Performance, Cranfield University, Cranfield: 1189-1196.
- Vagneur, K., and M. Peiperl. 2000. Reconsidering performance evaluative style. *Accounting, Organizations and Society* 25
- Vosselman, E.G.J. 1999. *Accounting en gedrag: zichtbare en onzichtbare effecten van management accounting* [transl. 'Accounting and behavior: visible and invisible effects of management accounting']. Kluwer, Deventer
- Waal, A.A. de. 2001. *Power of performance management how leading companies create sustained value*. John Wiley & Sons, New York
- Waal, A.A. de. 2002. The role of behavioral factors in the successful implementation and use of performance management systems. In: *Management: Research and Action*, edited by A. Neely, A. Walters & R. Austin, Centre for Business Performance, Cranfield University, Cranfield: 157-164
- Waal, A.A. de. 2003. Behavioral factors important for the successful implementation and use of performance management systems. *Management Decision* (41) 8
- Waal, A.A. de. 2004. Stimulating performance-driven behavior to obtain better results. *International Journal of Productivity and Performance Management* (4) 53: 301-316
- Waal, A.A., Z.J. Radnor, and D. Akhmetova (2004), "Performance-driven behavior: a cross-country comparison". In: *Performance measurement and management: public and private*, edited by A. Neely, M. Kennerly, and A. Waters, Centre for Business Performance, Cranfield University, Cranfield: 299-306
- Wall, T.D., J. Mitchie, M. Patterson, S.J. Wood, M. Sheeran, C.W. Clegg, and M. West (2004), 'On the validity of subjective measures of company performance'. *Personnel Psychology*, 57: 95-118
- Widener, S.K. (2005), *An empirical analysis of the levers of control framework*. Working paper (November), AAA Management Accounting Section 2006 Meeting Paper, available at SSRN: <http://ssrn.com/abstract=771994>
- Wiersma, E. 1998. Het gebruik van niet-financiële prestatie maatstaven: een literatuuroverzicht' [transl. 'The use of nonfinancial performance indicators: a literature overview']. *Tijdschrift BedrijfsAdministratie* (102) 1216: 350-355

Williams, R.S. 1998. *Performance management, perspectives on employee performance*.

International Thomson Business Press, London.

Zairi, M. 1994. *Measuring Performance for Business Results*. Chapman and Hall.

Appendix – Performance Management Analysis questionnaire

This appendix lists the criteria of the Performance Management Analysis for each dimension and for organizational environment. For research purposes, the detailed PMA questionnaire can be obtained from the author (www.andredewaal.nl).

Structural dimension: Responsibility structure of the organization		
Criteria	Unclear and inconsistent (1 – 5)	Clear and consistent (6 – 10)
Parenting style	Not clear	Clear
Tasks and responsibilities	Not clear	Clear
Guidelines for planning and targets	None	Strategic
Application of parenting style	Inconsistent	Consistent

Structural dimension: Content of the performance information		
Criteria	Low-quality information (1 – 5)	High-quality information (6 – 10)
Balance of information	Financial	Financial and non-financial
Strategic focus through CSFs and KPIs	Lacking	In place
Strategic alignment in the company	Hardly	Structured
Targets	Incremental and fixed	Ambitious and relative
Ranking between organizational units	Not applied	Applied

Structural dimension: Integrity of the performance information		
Criteria	Low-quality information (1 – 5)	High-quality information (6 – 10)
Reliability of information	Low	High
Inventory of user needs	Ad hoc	Regularly
Information on time	No	Yes
Consistency between data elements	Low	High
Standardization of data elements	Limited or not	For relevant elements

Structural dimension: Manageability of the performance information		
Criteria	Difficult to access (1 – 5)	User-friendly (6 – 10)
User-friendliness of information	Low	High
Volume of information	Large	Limited
Exception reporting	Not used	Used
Accessibility of underlying data	Low	High
Tools for information presentation	Stand-alone	Integrated

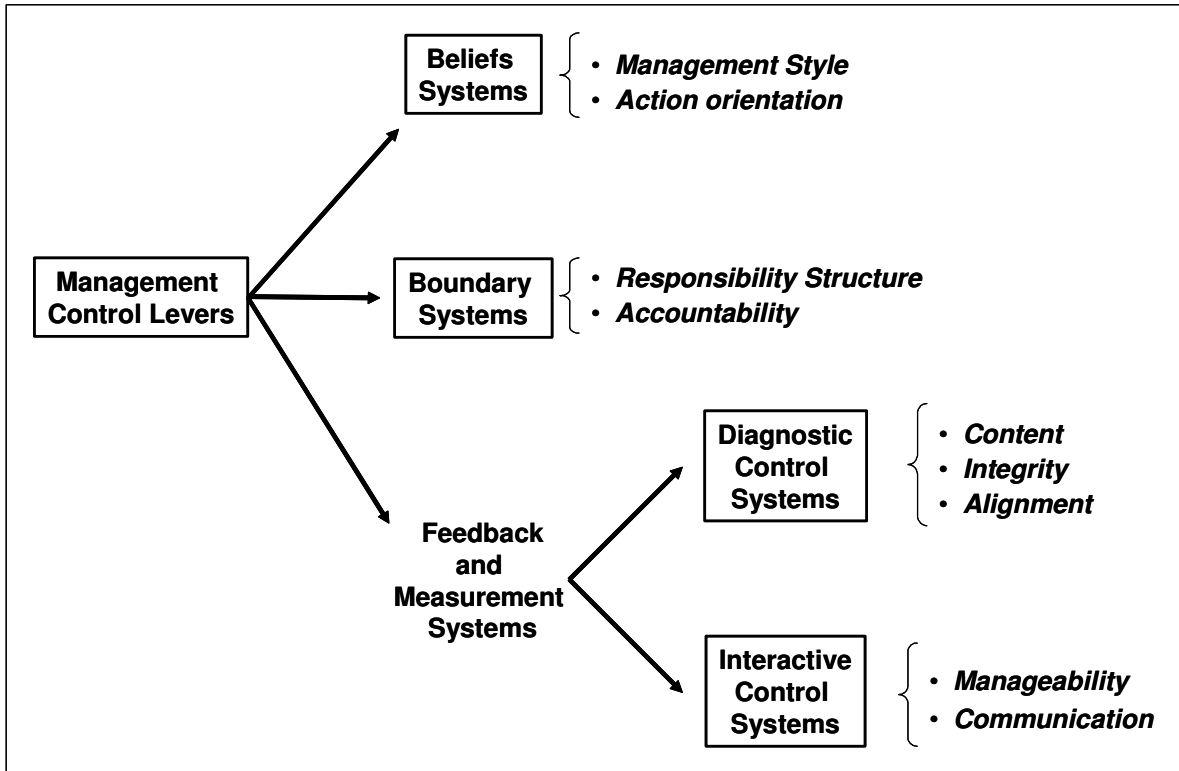
Behavioral dimension: Accountability		
Criteria	Discouraged (1 – 5)	Fostered and stimulated (6 – 10)
Relevance of information to users	Low	High
Managers usage of KPIs	Limited	Continuously
Influence on KPI results	Low	High
Commitment to results	Low	High
User involvement in changing KPIs	No involvement	High involvement

Behavioral dimension: Management style		
Criteria	Distant (1 – 5)	Committed (6 – 10)
Commitment to results	Not visible	Very visible
Managers' interest in employees' results	Limited	Continuously
Type of organizational culture	Settling accounts	Continuous improvement
Coaching by management	Limited	Frequent
Consistency in management behavior	Low	High

Behavioral dimension: Action-orientation of the organization		
Criteria	Inactive (1 – 5)	Pro-active (6 – 10)
Analysis of results	Limited	Frequent
Daily use of performance information	Limited	Continuously
Corrective action taken	Limited	Always
Prognosis made	Limited	Frequent
Decision-making based on information	Limited	Always

Behavioral dimension: Communication about performance		
Criteria	Ad hoc (1 – 5)	Open and continuously (6 – 10)
Top-down communication about results	Limited	Frequent
Bottom-up communication about results	Limited	Frequent
Communication structure in place	Closed	Open
Knowledge sharing between units	Limited	Frequent
Strategy formulation together with units	Limited	Always

Alignment		
Criteria	Stand-alone systems (1 – 5)	Aligned systems (6 – 10)
Evaluation system linked with PMS	No	Yes
Reward system linked with PMS	No	Yes
Training system linked with PMS	No	Yes
Improved results through the PMS	No	Yes
Attitude of people towards performance management	Negative	Positive



*Figure 1: Distinguishing features of Simons' levers of control model
(Extended from: Simons, R. 1995. Levers of control: page 180)*

Scree Plot

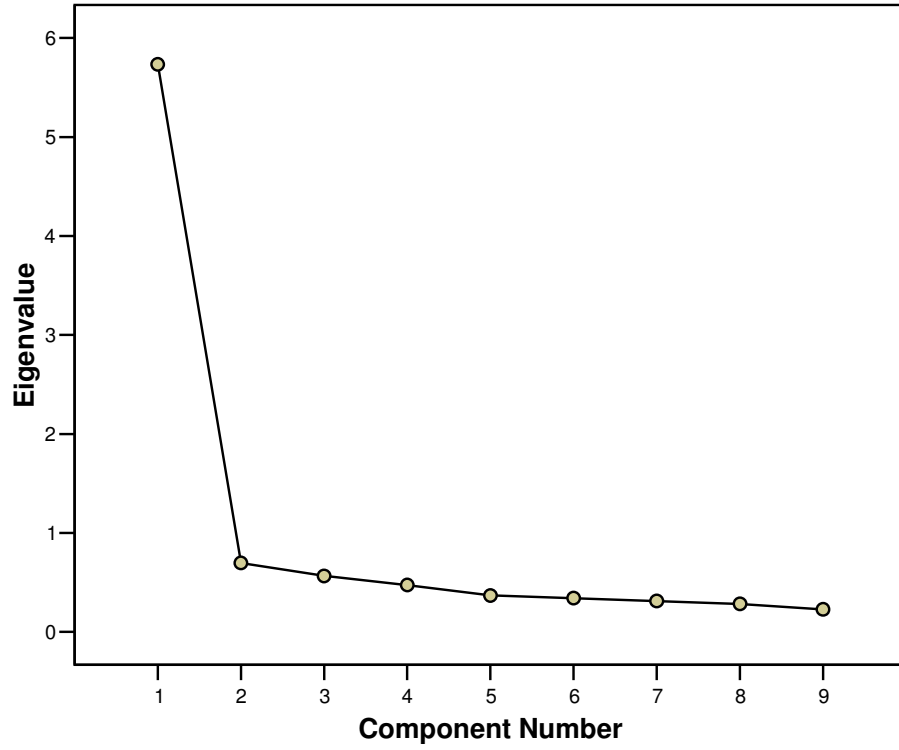


Figure 2: Scree plot of principal components for PDB dimensions

PDB dimensions	Mean	Median	Max.	Min.	Standard Deviation	Total N	Valid N
Alignment	5.39	5.60	10.00	1.00	1.57	577	576
Responsive Structure	5.90	6.00	10.00	1.80	1.34	577	577
Content	5.35	5.40	9.50	1.60	1.39	577	577
Integrity	5.76	5.90	9.20	1.00	1.39	577	577
Manageability	5.39	5.40	10.00	1.00	1.43	577	577
Accountability	5.63	5.80	9.80	1.00	1.34	577	577
Management Style	5.63	5.80	10.00	1.40	1.45	577	577
Action	5.56	5.60	9.80	1.00	1.52	577	577
Communication	5.46	5.60	9.80	1.00	1.48	577	577
Environment	6.82	7.00	10.00	2.00	1.25	577	533
Competitive Performance	6.46	6.70	10.00	1.00	2.13	577	441

Table 1: Descriptive statistics for the PMA database

PMA-aspects	Responsibility structure	Content	Integrity	Manageability	Accountability	Management style	Action orientation	Communication	Alignment	Competitive performance
Responsibility structure	1	.437(**) .000	.391(**) .000	.395(**) .000	.503(**) .000	.539(**) .000	.329(**) .000	.455(**) .000	.528(**) .000	.263(**) .001
Content		1 .	.439(**) .000	.476(**) .000	.668(**) .000	.578(**) .000	.522(**) .000	.563(**) .000	.546(**) .000	.247(**) .001
Integrity			1 .	.608(**) .000	.581(**) .000	.473(**) .000	.430(**) .000	.505(**) .000	.446(**) .000	.319(**) .000
Manageability				1 .	.572(**) .000	.493(**) .000	.400(**) .000	.441(**) .000	.495(**) .000	.197(*) .011
Accountability					1	.729(**) .000	.624(**) .000	.663(**) .000	.684(**) .000	.235(**) .002
Management style						1	.665(**) .000	.682(**) .000	.715(**) .000	.183(*) .017
Action orientation							1	.611(**) .000	.633(**) .000	.307(**) .000
Communication								1	.683(**) .000	.247(**) .001
Alignment									1	.272(**) .000

Table 2: Correlation between scores on the nine dimensions and competitive performance

(** correlation is significant at the 0.01 level (2-tailed); * correlation is significant at the 0.05 level (2-tailed))

PDB dimension	Component	
	Behavioral	Instrumental
Integrity	.291	.826
Manageability	.322	.793
Responsive Structure	.395	.633
Content	.582	.502
Management Style	.822	.353
Alignment	.810	.314
Communication	.800	.322
Action	.788	.331
Accountability	.713	.496

Table 3: 'Forced' principal component analysis (rotation method: Varimax with Kaiser Normalization, rotation converged in 3 iterations)

Dimensions		Sum of squares	df	Mean square	F	Sig.
Responsibility structure	Between Groups	13.067	2	6.534	3.864	.024
	Within Groups	187.684	111	1.691		
	Total	200.751	113			
Content	Between Groups	8.057	2	4.028	2.512	.086
	Within Groups	177.981	111	1.603		
	Total	186.038	113			
Integrity	Between Groups	28.044	2	14.022	10.459	.000
	Within Groups	148.819	111	1.341		
	Total	176.863	113			
Manageability	Between Groups	11.610	2	5.805	3.546	.032
	Within Groups	181.730	111	1.637		
	Total	193.340	113			
Accountability	Between Groups	15.465	2	7.732	5.242	.007
	Within Groups	163.719	111	1.475		
	Total	179.184	113			
Management style	Between Groups	9.093	2	4.546	2.710	.071
	Within Groups	186.190	111	1.677		
	Total	195.283	113			
Action orientation	Between Groups	20.000	2	10.000	6.356	.002
	Within Groups	174.630	111	1.573		
	Total	194.630	113			
Communication	Between Groups	20.114	2	10.057	5.953	.004
	Within Groups	187.524	111	1.689		
	Total	207.638	113			
Alignment	Between Groups	28.389	2	14.194	7.136	.001
	Within Groups	220.788	111	1.989		
	Total	249.176	113			

*Table 4: ANOVA-analysis for the three competitive performance subsets
(critical F value = 3.082)*

Dimensions	Low performance	Medium performance	High performance
Responsibility structure	4.91	5.83	6.02
Content	5.5	5.48	5.63
Integrity	4.43	5.85	6.05
Manageability	4.52	5.48	5.54
Accountability	4.75	5.78	5.96
Management style	5.02	5.76	5.95
Action orientation	4.72	5.56	6.05
Communication	4.31	5.47	5.69
Alignment	4.2	5.22	5.79

Table 5: Average scores on PMA-aspects and competitive performance, for the three organizational performance subsets