

Reconceptualizing the notion of relations underlying performance measurement models: Implications for research

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Reconceptualizing the notion of relations underlying performance measurement models: Implications for research

Structured abstract

Purpose: The objective of this paper is to reconceptualize the notion of relations underlying performance measurement models (PMMs) and explicate the ample exciting research opportunities that this reconceptualized viewpoint offers.

Design/methodology/approach: This is a conceptual paper, which primarily builds on and extends the contemporary research that challenges the traditional viewpoint that cause-and-effect relations are a necessary element of every PMM.

Findings: The reconceptualized viewpoint suggests that a PMM can be built on any combination of cause-and-effect, finality, and logical relations, as opposed to only cause-and-effect relations. This paper presents several exciting research opportunities that the reconceptualized perspective offers.

Originality/value: The different types of relations underlying PMMs and their appropriate validation techniques are a relatively novel concept and also, a complex phenomenon which has received very limited attention in the accounting literature. This paper extends this nascent literature by outlining the research implications of this novel concept.

Keywords: Performance measurement models; Cause-and-effect; Finality; Logical; Relations; Reconceptualize.

Paper type: Conceptual paper

JEL classification: M41

1. Introduction

Performance measurement models (PMMs) are at the heart of every organization (Chenhall, 2006) [1]. Appropriate design of PMMs is a prerequisite for their effective implementation and use (Bourne *et al.*, 2000, Cavalluzzo and Ittner, 2004). It has long been argued (i.e., the traditional viewpoint) that a PMM should be built on only cause-and-effect relations, and that lack of cause-and-effect relations in PMMs would make them flawed or ineffective (see Kaplan and Norton, 1996a, Ittner and Larcker, 2003). However, these scholars have rarely subjected this hypothesis to formal validation.

Surprisingly, a few contemporary studies that have subjected this hypothesis to formal validation have found weak (or no) support for the existence of cause-and-effect relations in PMMs (e.g., Malina *et al.*, 2007, Huelsbeck *et al.*, 2011). This indicates that cause-and-effect relations are not a necessary element of every PMM and that other types of relations such as finality and logical exist underlying PMMs (Malina *et al.*, 2007). Building on this contemporary research, the current paper argues to reconceptualize the notion of relations underlying PMMs. In this reconceptualized viewpoint, this paper argues that a PMM can be built on any combination of cause-and-effect, finality, and logical relations, as opposed to only cause-and-effect relations.

The different types of relations underlying a PMM is a relatively novel and complex phenomenon. The literature on the existence of different types of relations in a PMM (i.e., the reconceptualized viewpoint) is extremely limited and little recognized. However, recently, Malmi and Granlund (2009, p. 634) argue that “[...] it would be a mistake to say [...] there can always be clearly identifiable cause-and-effect relationships. Sometimes this might be the case, and sometimes not. [...] On the other hand, we welcome analyses of logical and finality relations as well [...]”. The objective of the current paper is to shed light on this less highlighted and little-recognized area in the PMM literature and spell out the abundant exciting research opportunities that this reconceptualized perspective offers.

The rest of the paper is structured as follows. The next section discusses the traditional viewpoint. The third section illuminates the idea of reconceptualizing the notion of relations underlying PMMs and provides a brief account of different types of relations. The fourth section presents the research implications of the reconceptualized viewpoint. The final section concludes the paper.

2. The traditional viewpoint

Numerous scholars have long argued that cause-and-effect relations are an essential element of every PMM (e.g., Eccles, 1991, Kaplan and Norton, 1992, Epstein and Westbrook, 2001, Ittner and Larcker, 2003). These scholars argue that without cause-and-effect relations a PMM cannot be effective. For example, Kaplan and Norton (1996b, pp. 64-65) assert that:

[...] the scorecard should incorporate the complex set of cause-and-effect relationships among the critical variables, including leads, lags ... The chain of cause-and-effect should pervade all four perspectives of a Balanced Scorecard.

This literature also suggests that when a PMM is built on cause-and-effect relations, the organization receives several benefits; for example, such a PMM enhances the organization's ability to predict future financial performance through the use of nonfinancial performance metrics (e.g., Kaplan and Norton, 1996a, Ittner and Larcker, 2003), fosters organizational focus and goal congruence (e.g., Kaplan and Norton, 2001), can educate managers about managing multiple performance metrics (Feltham and Xie, 1994), and improves managerial decision making process (Eccles, 1991).

However, a review of this cause-and-effect literature reveals that although most of these studies have recommended for building PMMs based on cause-and-effect relations, none of them have formally tested the existence of such relations in PMMs (Huelsbeck *et al.*, 2011). On the other hand, a few studies that appear to show the existence of cause-and-effect relationships are uncritical self-reports (e.g., Rucci *et al.*, 1998) and/or have actually documented, for example, the association between customer satisfaction and future financial performance (e.g., Banker *et al.*, 2000, Bryant *et al.*, 2004) [2]. It should be noted that correlation cannot be causation (for details, see Van der Stede, 2014, pp. 568-569).

3. Reconceptualization of underlying relations in PMMs

Recent research that has subjected the hypothesized cause-and-effect relations in PMMs to formal validation have found very weak (or no) cause-and-effect relations in PMMs. For example, Malina *et al.* (2007), by applying Granger causality test, found quite limited support for cause-and-effect relations in the PMM of a *Fortune* 500 company, which was following the same PMM for more than seven years at the time of the study. Although according to the traditional viewpoint this *Fortune* 500 company's PMM is flawed, the company had continued to use this PMM, and its 'performance' had improved over time (Malina *et al.*, 2007).

Similarly, in another study, Huelsbeck *et al.* (2011) tested for cause-and-effect relations in the PMM of a very successful US-based company that was following the same PMM for more than 10 years at the time of the study. However, the authors found very weak support for hypothesized cause-and-effect relations. Interestingly, when the authors showed the results of the test to the company's management, the management was neither surprised nor disturbed. Rather, the management remained confident about the accuracy of the PMM and was planning to expand the company's operation based on that PMM. Further, in a recent study, Islam (2016) investigated the PMM of a New Zealand-based energy and environmental service organization and did not find any unambiguous cause-and-effect relations underlying the organization's PMM.

Findings from these recent studies suggest that cause-and-effect relations are not a necessary element of every PMM and that there exist other types of relations, which are not recognized

by the traditional viewpoint. These findings seriously question the validity of the traditional viewpoint and warrant to reconceptualize the notion of relations underlying PMMs. The reconceptualized viewpoint suggests, as will be discussed, that a PMM can be built on any combination of cause-and-effect, finality, and logical relations, as opposed to only cause-and-effect relations.

Cause-and-effect relations, following Hume (1748/2007), are said to exist between two events – X (cause) and Y (effect) – if these three criteria are met: i) both events X and Y are logically independent, and one cannot rationally infer Y from X but empirically; ii) X and Y must occur sequentially where X precedes Y in time and space; and iii) the occurrence of X necessarily implies the subsequent occurrence of Y .

On the other hand, a finality relation exists between two events when a person believes that a particular action is the best or most desired means to an end, although he/she is aware of many other means to reach the same end (Arbnor and Bjerke, 2009). In finality relations, people's beliefs, actions, and outcomes are primarily guided by customs, policies, or values (Arbnor and Bjerke, 2009). For example, it may be the company's policy to ensure higher product quality, which is only one of many other means, to ensure higher customer satisfaction. A finality relation also exists when there is a reciprocal relationship between means and ends (Nørreklit, 2000). For example, a higher number of R&D activities may be necessary to obtain a satisfactory financial result, and, reciprocally, a satisfactory financial result may also be necessary to support a higher number of R&D activities. However, unlike cause-and-effect relations, finality relations are idiosyncratic to a particular context that might not be generalized beyond that particular context (Malina *et al.*, 2007).

Logical relations are the result of human constructs (e.g., language, mathematics) and are grounded in sound reasoning (Malina *et al.*, 2007). In logical relations, outcomes follow deductively from actions (Beall and Restall, 2014). A logical relation also exists between two variables when they are derived from a system which is based on logic (Nørreklit, 2000). For example, the relation between an increase in credit sales and an increase in accounts receivable is logical, as opposed to cause-and-effect, since they are based on the debit-credit logic of the accounting system. It should be noted that a relation cannot be both logical and cause-and-effect because it is a "logical impossibility, much like talking about a non-nuclear atomic device" (Nørreklit, 2003, p. 617).

4. Research implications of the reconceptualized viewpoint

This section presents the research implications of the reconceptualized viewpoint around four areas. First, Malina *et al.* (2007) and Huelsbeck *et al.* (2011) did not find strong support for the existence of cause-and-effect relations in their case organizations' PMMs, yet these organizations were operating successfully. However, in some cases, the cause-and-effect relations are mostly likely to exist. For example, the PMM (or its parts) that reflects the physical production function of a manufacturing organization might have cause-and-effect relations,

because such a production function is likely to follow the normal science. That is, a PMM can be built on any combination of cause-and-effect, finality, and logical relations.

What we know little about is what combination of relations enhances the effectiveness of a PMM. The effectiveness of a PMM can be operationalized into two dimensions: i) decision making, and ii) controlling. That is, an organization can use its PMM as a decision-making and/or controlling tool (e.g., Simons, 2000, Ferreira and Otley, 2009). Our knowledge is limited about the types of relation-built PMMs that serve best as a decision-making and/or controlling tool. Does a PMM serve well as a decision-making and/or controlling tool when the cause-and-effect relations are *complemented* by finality and/or logical relations? Or does a PMM perform well as a decision-making and/or controlling tool when the cause-and-effect relations are *substituted* by finality and/or logical relations? Are there any internal or external variables that can mediate and/or moderate these relationships?

Second, in their study, Malina *et al.* (2007) observed finality and logical relations as a substitute for cause-and-effect relations in the case organization's PMM. However, the authors were not sure whether this phenomenon – i.e., finality and logical relations as a substitute for cause-and-effect relations – was intentional or coincidental (Malina *et al.*, 2007). In a recent study, Islam (2016) also finds empirical evidence to support this phenomenon. Based on field observations, Islam (2016) argues that managers are likely to build these types of finality and logical relation-based PMMs *intentionally*.

The above research provides an excellent opportunity to investigate this phenomenon further. If managers build finality and logical relation-based PMMs intentionally, why do they do so? Do managers have any rationality behind building finality and logical relation-based PMMs? Or is this phenomenon primarily driven by managers' emotion what Boedker and Chua (2013) call 'affective behaviour'? Or is this phenomenon a mix of both rationality and emotionality? Or is this phenomenon simply the ignorance of managers? Our knowledge is very limited in this regard.

Third, in a survey of 157 companies across various industries, Ittner and Larcker (2003) show that majority of the surveyed companies do not test the relationships among underlying variables in their PMMs. Similarly, the managers of case organizations in Huelsbeck *et al.* (2011), Malina *et al.* (2007), and Islam (2016) seemed to show no or little interest in understanding relations underlying their organizations' PMMs. This has further implications for research. Does it mean that underlying relations in PMMs do not matter much to the managers to run their organizations? Or do managers not have enough knowledge to appreciate the value and implication of different types of relations underlying PMMs in running their organizations? Or do managers not have enough skills to run various tests to identify and understand underlying relations in their organizations' PMMs? Or is it a kind of managerial behavioural anomalies? The future research investigated into these questions could substantially increase our current state of limited understanding in this area.

This paper offers the final research implication of the reconceptualized view in relation to the validation of PMMs. Validation of PMMs is important because organizations move into a danger zone if the underlying assumptions in the PMMs are flawed or are not tested (Shafer, Smith, & Linder, 2005). Further, if the hypothesized links in the PMMs are flawed, the whole PMM will also be flawed, which, in turn, can mislead managers (Kaplan & Norton, 2004b, 2008). Validating PMMs not only allows the organizations to check whether the PMMs are correct but also to identify what performance metrics do (not) matter in specific contexts (Ittner & Larcker, 2009). In fact, not validating the PMMs can lead to a substantial waste of limited resources in the pursuit of inappropriate purposes (Ittner & Larcker, 2003). Therefore, it can be argued that validation of PMMs serves two purposes: i) to identify the problematic areas in the PMMs and offer their potential solutions, and ii) to ascertain the validity of non-problematic areas rather than relying on perception only.

However, unlike the traditional perspective, the reconceptualized view offers a vast array of validation techniques. The traditional view offers statistical tests as the sole validation technique (e.g., Ittner and Larcker, 2003). Although rigorous statistical tests such as Granger causality should be used to validate cause-and-effect relations, such a test cannot be definitive in validating finality relation-based variables in PMMs. Because validation of a finality relation as the best or only means is complicated by equifinality and finite data (Malina *et al.*, 2007). Therefore, due to the very nature of finality relations, statistical validation may be impossible. Rather, a financial cost-benefit analysis of finality relation-based actions and outcomes might explain their use despite an insignificant statistical relation (Malina *et al.*, 2007). Further, statistical tests can neither validate nor invalidate the logical relation-based variables; rather, deductive reasoning should be used to validate such logical relation-based variables (Nørreklit, 2000). Therefore, researchers interested in validating an organization's PMM should use appropriate validation technique(s) in alignment with the specific relation(s) based on which different parts of a PMM are built. Applying inappropriate validation technique(s) can mislead the conclusion drawn from such a PMM validation.

Nevertheless, applying appropriate validation techniques may be problematic for many organizations in the real-world. It is unlikely that all organizations will have historical quantitative data for all underlying variables in their PMMs. For example, when a new organization enters in the market, it comes up with its brand-new PMM. Also, an established organization may go for an organization-wide strategy review, which may require the development of an almost brand-new PMM. In both cases, the PMMs are in their early stage and many underlying variables are unlikely to be fully operational (Islam, 2016). In these cases, organizations are unlikely to have historical quantitative data for all variables in their PMMs. These provide both challenges and some interesting future research opportunities. In the absence of necessary quantitative data, how can the existence of cause-and-effect relations be refuted or validated? Can we use any qualitative technique to refute the existence of cause-and-effect relations? Also, in the absence of necessary quantitative data, performing a financial cost-benefit analysis to validate finality relation-based variables in a PMM may not be possible.

Therefore, a question for future research would be: Can we use any qualitative technique to validate finality relation-based variables?

Further, research on identifying appropriate qualitative validation techniques of PMMs is likely to have merits not only in the absence of necessary quantitative data but also in the *presence* of quantitative data. To perform quantitative validation of PMMs, some likely cost factors include the cost of maintaining a rich database, collecting additional data if high statistical power is required, and hiring a consultancy firm to conduct rigorous empirical tests (Huelsbeck et al., 2011). In a recent study, Farrell, Kadous, and Towry (2012) showed that communicating the *quantitative* linkages underlying PMMs to experimental subjects is *no more* beneficial than communicating *qualitative* linkages. Farrell et al. (2012) warned that the additional cost of quantifying the linkages underlying PMMs may not be justified. Therefore, identifying appropriate qualitative validation techniques of PMMs may provide new tools and greater flexibility to the managers, when they decide whether to go for validating their organizations' PMMs on the grounds of a cost-benefit analysis.

5. Conclusion

The traditional viewpoint suggests that cause-and-effect relations are an essential element of every PMM. However, a few contemporary studies rather show that cause-and-effect relations are not a necessary element of every PMM and that other types of relations such as finality and logical exist in PMMs. This paper highlights the existence of various types of relations underlying PMMs, which has thus far been little recognized in the PMM literature. In particular, the current paper argues to reconceptualize the notion of relations underlying PMMs by appreciating that a PMM can be built on any combination of cause-and-effect, finality, and logical relations, as opposed to only cause-and-effect relations. Building on contemporary research that challenges the traditional viewpoint, the current study explicates the exciting research opportunities that the reconceptualized perspective offers. It is believed that such research would advance our understanding substantially in the areas of PMM design in general and underlying relations in PMMs and their validation techniques in particular.

Endnotes

1. Following Malina *et al.* (2007), this study refers to the PMM as any kind of performance measurement system (e.g., the Balanced Scorecard, the Performance Prism) that helps the organization to measure its performance towards the achieving of its strategy, mission, and vision.
2. See Malina *et al.*, 2007, pp. 939-940 for a detailed review in this regard.

References

- Arbnor, I. and Bjerke, B., (2009), *Methodology for Creating Business Knowledge*, 3rd ed., SAGE Publications, London.
- Banker, R.D., Potter, G. and Srinivasan, D., (2000), "An empirical investigation of an incentive plan that includes nonfinancial performance measures", *The Accounting Review*, Vol. 75 No. 1, pp. 65-92.
- Beall, J. and Restall, G., 2014. Logical Consequence. In E.N. Zalta (ed.) *The Stanford Encyclopedia of Philosophy*. Fall 2014 ed.
- Boedker, C. and Chua, W.F., (2013), "Accounting as an affective technology: A study of circulation, agency and entrancement", *Accounting, Organizations and Society*, Vol. 38 No. 4, pp. 245-267.
- Bourne, M., Mills, J., Wilcox, M., Neely, A. and Platts, K., (2000), "Designing, implementing and updating performance measurement systems", *International Journal of Operations & Production Management*, Vol. 20 No. 7, pp. 754-771.
- Bryant, L., Jones, D.A. and Widener, S.K., (2004), "Managing value creation within the firm: An examination of multiple performance measures", *Journal of management accounting research*, Vol. 16 No. 1, pp. 107-131.
- Cavalluzzo, K.S. and Ittner, C.D., (2004), "Implementing performance measurement innovations: Evidence from government", *Accounting, Organizations and Society*, Vol. 29 No. 3-4, pp. 243-267.
- Chenhall, R.H., (2006), "The contingent design of performance measures", in A. Bhimani (ed.) *Contemporary Issues in Management Accounting*, Oxford University Press, Oxford, pp. 92-116.
- Eccles, R.G., (1991), "The performance measurement manifesto", *Harvard Business Review*, Vol. 69 No. 1, pp. 131-137.
- Epstein, M.J. and Westbrook, R.A., (2001), "Linking actions to profits in strategic decision making", *Sloan Management Review*, Vol. 42 No. 3, pp. 39-49.
- Feltham, G.A. and Xie, J., (1994), "Performance measure congruity and diversity in multi-task principal/agent relations", *The Accounting Review*, Vol. 69 No. 3, pp. 429-453.
- Ferreira, A. and Otley, D., (2009), "The design and use of performance management systems: An extended framework for analysis", *Management Accounting Research*, Vol. 20 No. 4, pp. 263-282.
- Huelsbeck, D.P., Merchant, K.A. and Sandino, T., (2011), "On testing business models", *The Accounting Review*, Vol. 86 No. 5, pp. 1631-1654.
- Hume, D., (1748/2007), *An Enquiry Concerning Human Understanding*, Oxford University Press, Oxford.
- Islam, S.M., (2016), "Relations underlying early-stage business models, abductive reasoning, and narrative tests", paper presented at the 8th Asia-Pacific Interdisciplinary Research in Accounting Conference, 13-15 July, Melbourne, Australia.
- Ittner, C.D. and Larcker, D.F., (2003), "Coming up short on nonfinancial performance measurement", *Harvard Business Review*, Vol. 81 No. 11, pp. 88-95.
- Kaplan, R.S. and Norton, D.P., (1992), "The balanced scorecard - Measures that drive performance", *Harvard Business Review*, Vol. 70 No. 1, pp. 71-79.
- Kaplan, R.S. and Norton, D.P., (1996a), *The Balanced Scorecard: Translating Strategy into Action*, Harvard Business School Press, Boston, Massachusetts.
- Kaplan, R.S. and Norton, D.P., (1996b), "Linking the balanced scorecard to strategy", *California Management Review*, Vol. 39 No. 1, pp. 53-79.

- Kaplan, R.S. and Norton, D.P., (2001), *The Strategy-focused Organization: How Balanced Scorecard Companies Thrive in the New Business Environment*, Harvard Business School Press, Boston, Massachusetts.
- Malina, M.A., Nørreklit, H. and Selto, F.H., (2007), "Relations among measures, climate of control, and performance measurement models", *Contemporary Accounting Research*, Vol. 24 No. 3, pp. 935-982.
- Malmi, T. and Granlund, M., (2009), "Agreeing on problems, where are the solutions? A reply to quattrone", *European Accounting Review*, Vol. 18 No. 3, pp. 631-639.
- Nørreklit, H., (2000), "The balance on the balanced scorecard a critical analysis of some of its assumptions", *Management Accounting Research*, Vol. 11 No. 1, pp. 65-88.
- Nørreklit, H., (2003), "The Balanced Scorecard: what is the score? A rhetorical analysis of the Balanced Scorecard", *Accounting, Organizations and Society*, Vol. 28 No. 6, pp. 591-619.
- Rucci, A.J., Kirn, S.P. and Quinn, R.T., (1998), "The employee-customer-profit chain at Sears", *Harvard Business Review*, Vol. 76 No. January-February, pp. 82-98.
- Simons, R., (2000), *Performance Measurement and Control Systems for Implementing Strategy*, Prentice Hall, New Jersey.
- Van Der Stede, W.A., (2014), "A manipulationist view of causality in cross-sectional survey research", *Accounting, Organizations and Society*, Vol. 39 No. 7, pp. 567-574.