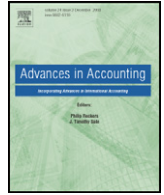




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# Advances in Accounting, incorporating Advances in International Accounting

journal homepage: [www.elsevier.com/locate/adiac](http://www.elsevier.com/locate/adiac)

## How do different performance measures affect managerial time orientation? Empirical evidence from sales managers in the oil and gas industry

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### ARTICLE INFO

Available online 29 March 2014

#### Keywords:

Performance measures  
Managerial time orientation  
Survey  
Sales managers

### ABSTRACT

This study investigates the relative effect of performance measures on managerial time orientation. We collect survey data on the actual time allocation of sales managers for tasks that affect financial performance on the short-, medium-, and long-term horizons. In addition, we obtain survey data on the specific metrics used by an oil and gas firm and classify them into three groups: traditional accounting (gross margin and budgeted costs), nonfinancial (market share and sales volume), and accounting returns (economic value added – EVA). Based on partial least-squares analysis, our results suggest that, in our setting, both nonfinancial and accounting return measures can supplement traditional accounting metrics to mitigate potential short-term orientation by inducing sales managers to consider mainly not only sales tasks but also investing tasks, which will affect the firm results more than a quarter ahead. In addition, our results imply that accounting return metrics are not better than nonfinancial measures in inducing a longer-term orientation in our research setting.

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### 1. Introduction

Managerial time orientation represents the intertemporal choices in an organizational context and is observed as a fundamental aspect of firm performance because an unbalanced allocation of resources between the short- and long-term can jeopardize the achievement of a firm's organizational goals and produce detrimental effects on its current and future performance (Matsumoto, Peecher, & Rich, 2000). It is therefore important to understand the determinants of managers' actions and the temporal effects of those actions.

Previous management and accounting literature has acknowledged that performance measures might have a role in how managers make intertemporal choices (e.g., Laverty, 1996; Marginson & McAulay, 2008). In fact, one of the potential explanations for the existence of short-termism is the use of 'flawed management practices' (Laverty, 1996), such as performance measures. However, these measures not only can induce managers to adopt a short-term orientation but also

can provide incentives for managers to think about the long-term consequences of their actions. To do so, the performance measurement system must include balanced performance measures that reflect the impact of managerial time orientation on firm value in both the short term and the long term (Datar, Kulp & Lambert, 2001; Lambert, 2001).

Although performance measures could potentially explain managerial time orientation, few accounting studies have empirically investigated how different performance measures affect managerial time orientation. However, even these few empirical accounting studies do not identify the specific performance measures used by firms for performance-evaluation purposes. Instead, these studies investigate performance measures in a general sense (e.g., Abernethy, Bouwens, & van Lent, 2013; Marginson, McAulay, Roush, & Zijl, 2010). The importance of obtaining details on the specific measures used by a firm is that it may be possible to obtain a more accurate prediction of the effect of performance measures on managerial time orientation by identifying what measures are more sensitive to longer-term decision making.

The aim of this study is therefore to investigate the relative effect of performance measures used for performance evaluation purposes on managerial time orientation. Previous empirical accounting literature suggests that the use of financial-accounting indicators such as net income leads profit center managers to reduce the level of long-term investment (Merchant, 1990). In addition, this accounting literature indicates that nonfinancial and accounting-return measures direct

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managerial attention to longer-term activities (Abernethy et al., 2013). We add to this literature by (i) obtaining details on both the specific metrics used by a firm in the performance evaluation process and the specific tasks performed by sales managers, (ii) testing whether managerial time orientation can be differently affected by performance measures depending on the type of task performed, and (iii) examining whether accounting-return metrics, including only a residual income measure, direct managers toward a longer-term orientation than nonfinancial metrics.

We estimate regressions of time allocation on the relative effect of each performance measure – traditional accounting, non-accounting, and accounting returns – used for evaluating managerial performance so we can evaluate the sensitivity of each performance measure to the specific action choices of the sales managers. To do so, we first conducted interviews with the purpose of identifying (i) the main tasks performed by the sales managers and (ii) the measures used by the business unit managers to evaluate the sales managers' performance. We then conducted a survey of 72 sales managers from two subsidiaries of a single Brazilian company in the oil and gas industry.

Our main results indicate that, in our setting, relative to traditional accounting measures, the increased use of nonfinancial metrics induces sales managers to think more about the longer-term consequences of sales tasks. In addition, we find that relative to traditional accounting measures, a greater weight placed on accounting-return measures in our research setting leads sales managers to consider the longer-term consequences of their tasks, mainly for sales tasks. We lastly do not find that the use of accounting-return measures in our setting induces sales managers to consider the longer-term effects of their tasks relative to nonfinancial measures. Therefore, our results imply that both nonfinancial and accounting-return measures can be used to supplement traditional accounting metrics to mitigate potential short-term orientation by inducing the sales managers of our research setting to consider mainly not only sales tasks but also investment tasks, which will affect their firm results more than one quarter into the future. In addition, our results imply that in our setting the accounting-return metric (economic value added – EVA) is not better than nonfinancial metrics in inducing sales managers to adopt a longer-term orientation.

## 2. Hypothesis development

### 2.1. Informativeness principle and managerial time orientation

The informativeness principle underlies most of the accounting literature that examines the implications of different performance measures on managerial time orientation. According to this principle, any additional performance measure that is costless and provides incremental information about managerial effort allocation should be included in the performance measurement system (Holmstrom, 1979). In terms of intertemporal choices, the question stemming from such principle is what combination of performance measures adequately reflects managers' contributions to short- and long-term value creation.

Based on the informativeness principle, multidimensional principal-agent models have identified the properties that performance measures must have to provide incremental value in a performance measurement system: (i) signal-to-noise ratio: a reduction in the risk imposed on the managers by selecting performance measures that are both sensitive and precise; and (ii) congruence: an inclusion of performance measures that are congruent with the firm's objectives (Datar, Kulp, & Lambert, 2001; Feltham & Xie, 1994).

In the context of intertemporal choices, to have a performance measurement system that reflects both the short- and long-term effects of managers' choices, an existing measure must be supplemented

so that if the single measure is incongruent in a certain direction (e.g., short-term actions), another measure that is more sensitive to managerial actions with the opposite effects (e.g., long-term actions) must be included (Lambert, 2001). This requires an understanding of the direction in which the existing measure is incongruent so that the firm can choose a new performance measure that is incongruent in the opposite direction to construct an overall performance measure that is as congruent as possible (Abernethy et al., 2013; Lambert, 2001).

Given the predictions based on the principal-agent model, the accounting literature develops more specific predictions regarding how traditional accounting, nonfinancial, and accounting-return performance measures can be combined in a performance measurement system that aims to mitigate myopic behavior (e.g., Dikolli & Vaysman, 2006; Dutta & Reichelstein, 2002; Sliwka, 2002). In addition, empirical accounting research tests these predictions in general and more specifically in terms of their implications for long-term decision making (e.g., Abernethy et al., 2013).

In the context of our setting, all sales managers are evaluated in terms of traditional accounting, nonfinancial, and accounting-return metrics. It is acknowledged that traditional accounting performance measures (e.g., accounting net income, operating cash flow, and divisional profits) can be incongruent with the optimal allocation of effort because these measures do not immediately reflect the long-term impact of actions performed by the manager (Feltham & Xie, 1994; Lambert, 2001; Merchant, 1990; Narayanan, 1985). We can therefore observe in our setting whether the use of a balanced set of performance measures, including nonfinancial and accounting-return metrics, can mitigate the potential incongruity problems associated with the use of traditional performance measures to induce managers to think about the long-term consequences of their actions.

### 2.2. The relative effect of performance measures

The attention to the incentive properties of nonfinancial measures has increased because Kaplan and Norton (1996) suggested the use of a more balanced set of measures, including financial and nonfinancial metrics. According to Kaplan and Norton (1996), these nonfinancial measures are drivers of financial outcomes; therefore, they are characterized as leading indicators of future performance. The leading property of nonfinancial metrics has been acknowledged by analytical (e.g., Dikolli & Vaysman, 2006; Dutta & Reichelstein, 2003; Sliwka, 2002) as well as empirical accounting research (e.g., Banker, Potter, & Srinivasan, 2000; Farrel, Kadous, & Towry, 2008; Ittner & Larcker, 1998; Ittner, Larcker, & Rajan, 1997).

Given the leading attribute of nonfinancial metrics, these measures can induce managers to consider actions that will affect long-term firm performance. In fact, previous accounting literature has demonstrated the implications of nonfinancial measures for future performance (e.g., Banker et al., 2000; Nagar & Rajan, 2005). These measures can inhibit short-term orientation by encouraging managers to give attention to activities (e.g., customer satisfaction) that are not captured by the operating results of the current period (Hemmer, 1993). This is possible because nonfinancial performance measures “can be tailored to measure *specific* activities of the firm that senior management knows to be important in the longer term” (Abernethy et al., 2013, p. 10). In addition, the inclusion of a more balanced set of performance metrics allows for the quantification of particular goals to be pursued by managers (e.g., sales managers) at different levels of the organization, which facilitates the implementation of corporate strategy (Kaplan & Norton, 1996).

Analytical accounting studies have generally supported this expectation (e.g., Dikolli & Vaysman, 2006). In addition, in an empirical study, Abernethy et al. (2013) shed some light on the relative impact of financial and nonfinancial measures on managerial intertemporal choices by indicating that nonfinancial efficiency metrics (e.g., lead time, percent

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