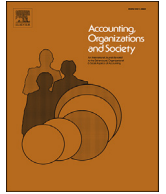




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## Theorizing and testing bidirectional effects: The relationship between strategy formation and involvement of controllers

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## ABSTRACT

Many relations in social settings, such as management accounting, are bidirectional. Some effects unfold rapidly, and others occur slowly. Quantitative research in empirical management accounting has largely ignored this phenomenon. Our paper makes a case for integrating the time dimension into theory and empirical analysis. Using the relationship of an organization's strategy formation approach and controllers' involvement in the strategy process, we illustrate how bidirectional effects of different speeds can be theorized. Moreover, we show how cross-lagged effects models can help to test the direction of an effect for a given time interval. Data from two matched surveys with a four-year time lag provide the following results. First, in a baseline model, we replicate previous cross-sectional approaches and find similar results, namely a statistically significant relation between strategy formation and controller involvement. Second, we exploit the time dimension and find a statistically significant association between involvement at t1 and strategy formation at t2. This is consistent with the view that controllers shape the strategy formation approach in a slow, bottom-up process that takes several years. Thus, whereas previous cross-sectional studies assume controllers' involvement results from the strategy formation process, our study finds that controllers can also play an active role in shaping the organization's strategy process. The results illustrate how incorporating bidirectional effects and considering theoretically meaningful time intervals can improve theory development and theory tests in management accounting research.

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### 1. Introduction

Many relations in social sciences are bidirectional (Williams & Podsakoff, 1989). Moreover, some effects occur faster than others. Researchers consequently have emphasized the importance of time in theories and methods, particularly the time lag between causes and effects (George & Jones, 2000; Mitchell & James, 2001). As Luft and Shields (2003) note, “organizational structure changes much more slowly in response to management accounting than management accounting changes in response to organizational structures” (p. 194). They studied empirical management accounting research published in top journals before 2002 and reported that only 33 out of more than 500 papers investigated bidirectional relations, all of which were qualitative case studies. Similarly, Hershung, Mahlendorf, and Weber (2017) reviewed the management accounting literature published between 2002 and 2012 and

identified only six quantitative management accounting studies that incorporated bidirectional effects, and most of these did not explicitly theorize the timing of the effects. This negligence regarding bidirectional relations and time lags in quantitative empirical management accounting research could lead to incorrect model specifications and conclusions.

In this study, we contend that investigating bidirectional effects and considering their time intervals can significantly enhance our understanding of management accounting. We illustrate this using the example of the relation between the strategy process and controllers' involvement in strategy. Prior studies using cross-sectional data have suggested that the strategy formation approach affects controllers' involvement (e.g., Cadez & Guilding, 2008). We first follow their cross-sectional approach and find similar results. However, we propose that the relation is actually more complex and that the reversed causal effect also is theoretically plausible. In particular, we provide theoretical arguments suggesting that controllers' involvement responds faster to changes in the strategy formation approach than vice versa.

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Using matched data from two surveys with a four-year time lag, we provide an empirical example of how to calculate and interpret a structural equation cross-lagged effects model. Specifically, we provide strong empirical evidence for a slow (time-lagged) effect of controllers' involvement on strategy formation. This result is robust to the inclusion of several control variables and to the application of different estimation methods.

Our paper aims to make three contributions. First, it draws attention to an important but under-researched topic in empirical management accounting research: the speed and direction of causality. Our paper offers a fresh perspective that demonstrates how time can be explicitly incorporated in theory development and hypotheses testing. We thereby address calls that time can and should play a more important role in research (George & Jones, 2000; Mitchell & James, 2001). Moreover, our paper provides an example for future quantitative studies as to how bidirectional effects with different speeds can be theorized.

Second, our paper details how to test bidirectional effects empirically using data collected at two time points. Specifically, the paper explains how a cross-lagged effects model helps to disentangle bidirectional effects. Whereas cross-lagged effects models are common in other fields (e. g., Eby, Butts, Hoffman, & Sauer, 2015; Kröger, Hoffmann, & Pakpahan, 2016; Lang, Bliese, Lang, & Adler, 2011; Mathieu, Kukenberger, D'Innocenzo, & Reilly, 2015), they are novel in management accounting research (Janke, Mahlendorf, & Weber, 2014). Thus, this paper contributes to the goal of introducing more rigorous tests of causal relationships in management accounting survey research (van der Stede, 2014; van der Stede, Young, & Chen, 2005).

Third, our example of theorizing and testing of bidirectional effects advances the understanding of controllers' role in the strategy process. Prior literature has indicated an increasingly strategic role of controllers (e.g., Byrne & Pierce, 2007; Chenhall, 2003), but the theoretical understanding and empirical evidence about this phenomenon are limited. Our study on the relationship between an organization's strategy formation approach and its controllers' involvement suggests that controllers can actively shape the strategy process. Specifically, the longitudinal analysis shows that controllers contribute to a more deliberate (less emergent) strategy approach, which becomes apparent after a certain time lag. Thus, when considering a time interval of several years, the direction of causality is opposite to what prior cross-sectional studies have suggested. This finding supports the view of several qualitative studies that the relationship between strategy and management accounting is not unidirectional and static (e.g., Ahrens, 1997; Jørgensen & Messner, 2010; Skærbæk & Tryggestad, 2010).

Considering these contributions, our study hopefully stimulates the investigation of bidirectional effects and the explicit consideration of appropriate time intervals in future management accounting research by raising awareness of such effects and by providing an empirical approach that other researchers can follow.

## 2. Bidirectionality in management accounting research

Although previous quantitative research in management accounting has almost exclusively focused on unidirectional effects,<sup>1</sup> the relation between two variables is often bidirectional. For example, Luft and Shields (2003) discuss the relations between management accounting and strategy. Many scholars have argued

<sup>1</sup> One notable exception is the study by Boschen et al. (2003), which uses a vector autoregression model to address the bidirectional relation between compensation and performance.

that strategy influences how much management accounting information is used (e.g., Davila, 2000) or that different strategies create different patterns of management control use (e.g., Govindarajan & Fisher, 1990). However, management accounting systems also can be important resources for formulating and implementing strategies (e.g., Chenhall & Langfield-Smith, 2003; Simons, 1995).

Regarding the relation between budgeting and performance, Merchant (1984) studied whether certain situational characteristics, such as departmental size or functional differentiation, determined different approaches to budgeting in manufacturing departments and how these approaches influenced performance. However, he concluded from his results that the effect could also go in the opposite direction. Specifically, poorly performing departments may “have lower budgeting autonomy ... and greater requirements to explain budget variances” (Merchant, 1984, p. 302) than high performing departments. Van der Stede (2000) similarly suggested “that business units that have been more profitable enjoy more budget flexibility” (p. 610).

Simons (1988) studied the relationship of tight budgets and performance at the firm level and suggested a positive relationship. He argued that profitable companies “may also be successful in eliminating slack in budget goals thereby improving their performance, at least on a short term basis, by such actions” (p. 278). Alternatively, successful firms with large cash reserves can become lenient with respect to cost control. In this case, the bidirectional effects might have opposite signs: a negative effect of success on tight budgetary control and a positive effect of tight budgetary control on (short-term) success.

Bidirectionality not only seems to exist in strategic choice, budgeting, and performance, but also in the interplay between management accounting and perceptions or attitudes of managers. Several studies have shown that perceptions of the environment influence decisions about management control systems' design and use (Burkert & Lueg, 2013; Widener, 2007). Janke et al. (2014) also argued that, in their particular case, crisis perception influenced the interactive use of management control systems. However, they followed an additional line of reasoning in the reversed causal direction and found empirical support that interactive use of management controls also could influence managers' perceptions about external crisis effects.

These examples indicate that many relations in management accounting have inherently bidirectional characteristics. However, few studies have adequately modeled the causal complexities of the relationships under investigation. This is problematic, because implications of study results are potentially biased when scholars disregard bidirectional effects or use insufficient analytical approaches. According to Luft and Shields (2003, p. 40), unidirectional models can limit our understanding “when they make the independent variables look like levers that can be pulled without generating recoil from the other end of the lever. The unidirectional models represent a world in which managers who want to raise performance can simply raise the level of budget goal difficulty or performance-contingent compensation or increase monitoring, without generating reverse effects or resistances” (p. 40). Reviewing the contingency-based management control literature, Chenhall (2003) also emphasized the limitations of cross-sectional designs: “Given the existence of cyclical relationships, the predictions from contingency-based theory may differ depending on which stage of the cycle is being proposed. Moreover, given that most contingency-based research has used cross-sectional survey methods, the results are relevant to only one stage of the cycle” (p. 156).

Consequently, many researchers have called for longitudinal research designs, such as cross-lagged panel models. Among the first, Shields (1997) suggested several opportunities to improve survey research, such as “using cross-lagged designs in order to

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