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Potential model misspecification bias: Formative indicators enhancing theory for accounting researchers ☆

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Abstract

This paper describes why and when formative factors, in combination with reflective measures, can be used in accounting research to better represent complex theoretical constructs. We argue that the exclusive use of reflective factors constrains theory development and may lead to imprecise measurement. We provide a review of 66 published research papers from *Accounting*, *Organization and Society*, *The Accounting Review*, *Contemporary Accounting Research*, *Auditing: A Journal of Practice & Theory*, *Accounting*, *Auditing*, *& Accountability Journal*, *Behavioral Research in Accounting*, *International Journal of Accounting*, *Journal of Accounting and Public Policy*, *Management Accounting Research*, *Abacus*, and *Journal of Management Accounting Research* using Structural Equation Models (SEM) from 1992 to 2008 to illustrate improvement of misspecification bias in leading accounting journals. Our findings suggest that most of the studies modeled constructs that did not include formative indicators.

Keywords: lLtent constructs; Formative and reflective indicators; Structural equation models; Partial least squares

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1. Introduction

Accounting researchers are making a considerable effort to develop structural equation models (SEM) that may help explain complex constructs.[1] Indeed, this research is largely concentrated in the behavioral area rather than in the capital market field. Although the frequency of use of latent constructs has increased dramatically in the last two decades (Smith & Langfield-Smith, 2004; Bisbe, Batista-Fogueta, & Chenhall, 2007; Henri, 2007), there is only one published article in a top accounting journal dealing with complex constructs that use formative indicator measurement models.[2] Instead, there is a growing tendency among researchers to measure constructs only with reflective indicators, even when formative indicators are more appropriate (Bagozzi, 2007; Bisbe et al., 2007; MacKenzie, Podsakoff, & Jarvis, 2005; Jarvis, MacKenzie, & Podsakoff, 2003). In accounting research, the inclusion of formative indicators becomes useful for predictive models that replicate investors' and creditors' perceptions and judgments (reflective factors) and that combine accounting information (formative constructs) into useful concepts such as liquidity, profitability, and leverage (Rodgers, 1999).

The distinction between reflective and formative constructs, described in detail in the next section, looms large in that it helps to theoretically define and capture latent (theoretical) concepts. The relationship between variables can be specified by epistemic or correspondence rules (Fornell & Bookstein, 1982; Hulland, 1999; Bisbe et al., 2007), which can be of two types — reflective or formative. Reflective indicators are the typical indicators of classical test theory and factor analysis models. Examples in management research might be managers' perceptions and judgments, which are latent and are typically considered underlying causes of overt behavior or of measured scores on decision tasks' scales. Reflective factors suggest that the unobservable or latent construct "causes" the observable measurement items. In formative indicators, the "unobservables" are considered effects rather than causes. An example of formative indicators is a theoretical variable "formed" from one or more observables. For example, "liquidity" is considered an abstract construct composed of observable variables, such as the current ratio, quick ratio, working capital ratio, and so forth. This process assumes the latent construct is a result of engineering or sampling several other items that represent a better and more complete picture (Rodgers, 1999). This process is data driven in that it combines similar pieces of information together. Research that demands the use of archival data (e.g., management accounting research, capital markets research, auditors' opinions, and internal managerial information) requires such formative factors.

[1] As discussed in Rouse and Corbitt (2008), this paper uses a broad definition of SEM. It includes a number of largely linear modeling approaches that are based on solving a set of structural equations using matrix algebra. To avoid confusion, we clarify that there are two methods in order to estimate the parameters of an SEM: the covariance-based approach and the variance-based approach. The parameter estimation process in the covariance-based method attempts to minimize the differences between the sample covariances and those predicted by theoretical model. PLS is a variance-based SEM technique. In contrast to covariance-based SEM, PLS focuses on maximizing the variance of the dependent variables explained by the independent ones instead of reproducing the empirical covariance matrix.

[2] Dowling (2009) has recently published an article in *The Accounting Review* using both formative and reflective constructs. To this end, she employed PLS instead of a covariance-based SEM.