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Endogeneity and the dynamics of internal corporate governance ☆

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ABSTRACT

We use a well-developed dynamic panel generalized method of moments (GMM) estimator to alleviate endogeneity concerns in two aspects of corporate governance research: the effect of board structure on firm performance and the determinants of board structure. The estimator incorporates the dynamic nature of internal governance choices to provide valid and powerful instruments that address unobserved heterogeneity and simultaneity. We re-examine the relation between board structure and performance using the GMM estimator in a panel of 6,000 firms over a period from 1991 to 2003, and find no causal relation between board structure and current firm performance. We illustrate why other commonly used estimators that ignore the dynamic relationship between current governance and past firm performance may be biased. We discuss where it may be appropriate to consider the dynamic panel GMM estimator in corporate governance research, as well as caveats to its use.

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1. Introduction

Empirical corporate finance research, which attempts to explain the causes and effects of financial decisions, often has serious issues with endogeneity. This is because it is generally difficult to find exogenous factors or natural experiments with which to identify the relations being examined. However, the implications for the empirical work's usefulness if it does not properly deal with endogeneity can be substantial. In a review article that provides guidance on addressing endogeneity issues in corporate finance, Roberts and Whited (forthcoming) note that "endogeneity leads to biased and inconsistent parameter estimates that make reliable inference virtually impossible." A large body of empirical research suggests that certain governance structures drive improved performance, but this research is plagued with endogeneity issues. We often cannot ascertain if the causation is

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actually reversed (e.g., performance drives governance) or if governance is merely a symptom of an underlying unobservable factor, which also affects performance. Thus, it is difficult to determine what the parameter estimates actually suggest.

We respond to these endogeneity concerns in a specific setting, the relationship between boards and performance. This paper applies a well-developed panel GMM estimator to a data set of 6,000 firms over a 13-year period from 1991 to 2003. We find no relation between current board structure and current firm performance. This result is inconsistent with much earlier work and policy recommendations of many commentators. To strengthen our empirical argument, we also illustrate why estimators that find a relation may be biased. We demonstrate how the panel GMM estimator can be used to control for the dynamic nature of the performance–governance relationship suggested by theorists, while accounting for other sources of endogeneity in corporate finance research.

Most empirical corporate finance researchers acknowledge at least two potential sources of endogeneity: unobservable heterogeneity and simultaneity. However, one source of endogeneity that is often ignored (explicitly or implicitly) arises from the possibility that current values of governance variables are a function of past firm performance. Neglecting this source of endogeneity can have serious consequences for inference. This is especially true since the difficulty in identifying natural experiments or exogenous instruments in many settings means that corporate governance researchers often rely on panel data and fixed-effects estimates for inference. Traditional fixed-effects estimation can potentially ameliorate the bias arising from unobservable heterogeneity. However, it does this at the expense of a strong exogeneity assumption, one that is often not explicitly recognized by researchers. That is, it assumes that current observations of the explanatory variable (e.g., board structure) are completely independent of past values of the dependent variable (typically firm performance, value, or some other governance attribute), an assumption that we argue is not realistic.

We recognize that ignoring the dynamic nature of the structure performance relationship in empirical work presents significant concerns. To deal with this issue, we have two broad goals in this paper: (1) understand the dynamic relation between boards and performance, and (2) understand how to use dynamic panel estimators in this context (and similar situations). There are four basic steps in our analysis. First, we present intuitive and theoretical arguments, and empirical results, that suggest that corporate governance is dynamically related to past firm performance. Second, we show how a well-developed dynamic estimator is well suited to deal with the dynamic nature of the relation between corporate governance and performance. Third, we apply the dynamic GMM estimator to our panel to estimate the relationship between board structure and performance and the determinants of board structure. Fourth, we discuss the implications of our results with the dynamic GMM estimator for dealing with endogeneity in the governance–performance relationship and other governance estimations, as well as caveats to its use.

We start with theoretical arguments building on Hermalin and Weisbach's (1998) model, which shows that board structure is partly a function of the bargaining process between the chief executive officer (CEO) and the board, and that since the CEO's bargaining position is a function of her ability (measured by past firm performance), board structure depends on past firm performance. Consistent with this argument, we find empirical evidence that board independence is negatively related to past firm performance.

Another argument we advance, which combines insights from theoretical work by Raheja (2005) and Harris and Raviv (2008), is that past performance has a direct influence on the firm's information environment, profit potential, and the opportunity cost of outside directors, all of which are factors that may affect the optimal board structure. Indeed, we find empirical evidence that firm characteristics that proxy for these factors (e.g., firm size, market-to-book ratio, etc.) are themselves related to past firm performance. While the theoretical models we invoke are not explicitly dynamic, the implications we draw from them, and our empirical evidence, suggest that any empirical estimation of the effect of board structure on past firm performance that ignores the dynamic relation between current board structure and past performance (as do traditional fixed-effects estimators) will yield inconsistent estimates.

Next, we show that, subject to caveats, the dynamic nature of the relation between corporate governance and performance actually sets up a powerful methodology for identifying the causal effect of governance on performance. This dynamic panel GMM estimator, developed in a series of papers by Holtz-Eakin, Newey, and Rosen (1988), Arellano and Bond (1991), Arellano and Bover (1995), and Blundell and Bond (1998), improves on ordinary least squares (OLS) or traditional fixed-effects estimates in at least one of three important ways. First, unlike OLS estimation, we can to include firm-fixed effects to account for (fixed) unobservable heterogeneity. Second, unlike traditional fixed-effects estimates, it allows current governance to be influenced by previous realizations of, or shocks to, past performance. Third, unlike either OLS or traditional fixed-effects estimates, a key insight of the dynamic panel GMM estimator is that if the underlying economic process itself is dynamic – in our case, if current governance is related to past performance – then it may be possible to use some combination of variables from the firm's history as valid instruments to account for simultaneity. Thus, an important aspect of the methodology is that it relies on a set of "internal" instruments contained within the panel itself: past values of governance and performance can be used as instruments for current realizations of governance. This eliminates the need for external instruments.

We apply the dynamic panel GMM estimator to two often-studied aspects of corporate governance: (1) the effect of board structure on firm performance and (2) the determinants of board structure, and compare the results to those obtained from OLS or traditional fixed-effects estimates. Most prior studies of the effect of board structure on performance have estimated "static" models

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