Discussion of “Asset Valuation and Performance Measurement in a Dynamic Agency Setting”

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1. Introduction

One of the most encouraging things about this paper is that the authors are able to formulate and solve a genuine multiperiod model to address performance measurement issues. In many respects, we need a multiperiod model to have an accounting problem to talk about. In single period models, cash flow and accrual accounting numbers are identical; multiperiod models are therefore essential to the study of accounting performance measures.\(^1\) Despite the obvious importance, not much work has been done on multiperiod models in the agency literature. The reason is, of course, tractability problems. In most multiperiod models, numerous technical issues arise that are often tangential to the accounting or performance measurement issues that we would like to focus on as accounting researchers. For example, even with models where everything seems to be independent over time, we have to worry about borrowing and lending, wealth effects, randomization, how the contract parameters in one period depend on realizations from prior periods, the form of the contract, the ability to commit to long term contracts, etc. Even information signals that would seem to be informationally “meaningless” sometimes play an important role in helping to randomize actions, or in coordinating the actions of different parties.

Some papers have addressed multiperiod issues in an *ad hoc* fashion by analyzing models that are really one period models, but in which the true outcome is not observed till beyond the contracting horizon. In these models, some of the agent’s actions may have only a “short term” effect that is properly captured by that period’s accounting earnings, whereas other actions may have longer term effects that the current period accounting number does not capture. These papers can analyze performance measurement issues, the congruity of a performance measure with the real outcome, the motivational effects of short term measures, etc., but the models are not truly multiperiod. See Bushman and Indjejikian (1993), Feltham and Xie (1994), Datar *et al.* (1999), and Feltham and Wu (1999) for examples of single period models of performance measurement where the agent is responsible for multiple actions.

Recently there has been renewed interest in multiperiod models that has been spurred in part by technical breakthroughs, and in part by an increased willingness by researchers to be more restrictive (less general) in their modeling. In some cases, researchers have placed exogenous limitations on the contract form (e.g., linear contracts), or exogenous restrictions on the form of the agent’s utility function (e.g., the negative exponential utility function).

There have been two branches of recent multiperiod papers that employ models and technology that are similar in many respects, yet yield very different conclusions regarding
optimal performance measurement. One branch focuses on renegotiation or lack of ability to commit to long term contracts. In these papers, information (or “accurate” performance measurement) at intermediate stages of the model is “bad”; it hurts welfare. While the reasons are somewhat different in different papers, they are generally related to the idea that the release of information decreases the ability of the principal and the agent to insure the agent against risk. That is, risks that are \textit{ex ante} optimal to insure against become \textit{ex post} optimal to renegotiate. To make sure these risks remain insurable, the two parties agree to garble the information that will be available at intermediate dates or delay its release, or aggregate signals. See Arya \textit{et al} (1998), Gigler and Hemmer (1998), Indjejikian and Nanda (1998) and Demski and Frimor (1999) for examples.

The other branch of the multiperiod literature focuses on motivating long term investments. These papers often make strong assumptions about the information that is available about future cash flows, and they derive strong links between optimal performance measures and economic valuation measures. Optimal performance measures are very forward looking (or based on accrual decisions that are very forward looking). Economic Value Added (EVA) or residual income based performance measures are often found to be optimal. Examples of these papers include Rogerson (1997) and Reichelstein (1998).

Dutta and Reichelstein’s paper develops a model in which the agent’s actions affect the operating performance (sales) of the firm, but not the financing performance (collections). Unfortunately, many performance measures, including net income, are affected by both the operating and financing performance of the firm. In addition, some measures are affected earlier than other measures (i.e., net income versus cash flow). Ideally, we’d like to be able to remove the financing effects on performance in order to shield the agent from this source of risk. The paper develops ways to do this that involve the use of (a) residual income as the optimal performance measure and (b) an accounting system that keeps track of receivables in the “right” way. The paper also addresses the question of whether the “right” way to measure receivables for incentive and compensation purposes is also the way that values them accurately on the balance sheet. Here the answer varies from one section to the next, depending on what information is available to separate different types of cash flows. In particular, it shows conditions where the optimal accounting system that underlies the residual income calculation may delay the recognition of cash flows. Therefore, the paper is interesting because it combines elements of both streams of the multiperiod literature discussed above.

2. Model and Analysis

The agent’s effort in period \( t \) (denoted \( a_t \)) generates sales in that period, and it is scaled so that the effort equals the present value of the expected net cash flows to be obtained from the sales made in that period. The realized cash flows are also affected by what the paper calls a “timing” effect and a “bankruptcy” effect. The timing effect reflects how the expected payments are structured over time. Specifically, \( a_t + y_0 \) is the expected cash flow in period \( t \) (the period in which the sale is made), and \( y_j \) is the expected cash flow in the \( j \)th period after the sale made in period \( t \). By construction, the present value of the \( y_j \) series over the time equals zero. In most cases, we would expect \( y_0 \) to be negative to reflect a first period