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Divestment options under tacit and incomplete information☆

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ABSTRACT

While the literature has mainly focused on why a firm decides to divest a subsidiary, we investigate theoretically what the best divestment option is for a firm to divest a subsidiary. The firm chooses among the four most popular divestment options in practice: sell-offs, spin-offs, carve-outs, and management buyouts. In an infinite-period model, where divestiture is completed in the first two periods, the owners of a parent firm divest a subsidiary for the best value. The information possessed by the owners, subsidiary managers and outside buyers about the subsidiary's profitability may be complete or incomplete (the knowledge of information) and this information may be explicit or tacit (the nature of information). We investigate how the nature of information, the knowledge of information, risk aversion and discount on future performance determine the best divestment option.

1. Introduction

Corporate divestitures, especially management buyouts (MBOs), spin-offs and carve-outs, have gained much popularity recently. There is hence an increasing interest in academic research on corporate divestiture. This paper offers a theoretical analysis of the four most popular divestment options. For convenience, we refer to divestiture as when a firm divests one of its wholly owned subsidiaries.

Divestiture is very different from sales of non-productive financial assets. Since the subsidiary being divested is a productive asset, the timing of sale, information and synergy with the acquirer are important considerations. In particular, information may play an important role. For example, a parent company may choose to divest a subsidiary via an MBO due to the subsidiary managers' information advantage. Welch (1989) and Nanda (1991) find that a key characteristic of going-public decisions is that the owners of the firm have an informational advantage over outside buyers. Slovin et al. (1995) find that the owners opt for carve-outs if the subsidiary is overpriced in the market. According to Pham (2012), a parent firm's pre-divestiture level of asymmetric information is related to its choice of divesting via a sell-off. Schipper and Smith (1986) attribute a gain in price of the parent stock to the parent's benefiting from more publicly available information about the subsidiary after a carve-out.

Further to prior literature on the role of incomplete information, we argue that the *nature of information* (explicit versus tacit) should also be considered. This is particularly so in our model in which divestiture is a staged divestment of a subsidiary over two periods. People need time and experience to digest information, just as it takes many hours of practice to really learn to swim. We distinguish between "information being available" and "information being complete". While the meaning of a piece of information being available is clear, a piece of information being complete to an agent means not only that the information is available to the agent but also that the agent can fully digest and utilize the information. If information is *explicit*, when information is available to an

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agent, it is complete to the agent immediately. If information is *tacit*, when information is available to an agent, it takes some time (one period in our model) for it to become complete to the agent (time to digest).[1]

The key to this paper is that the nature of information may matter in the choice of divestment option. The firm owners, subsidiary managers, and outside buyers are all economic agents in our model. Divestment options affect the revelation of profitability information to economic agents. This information may be symmetric or asymmetric, and it may be explicit or tacit. To our knowledge, we are the first to develop a theory of divestiture that takes into account the nature of information. Prior literature on divestiture does provide some empirical evidence regarding the nature of information. For example, Bergh and Lim (2008) find that "experience with corporate restructuring (sell-offs, spin-offs) influence subsequent restructuring and financial performance." They find that cumulative and repetitive experience with sell-offs is related to the subsequent adoption of sell-offs and to better financial performance, while short-term and contemporaneous experience with spin-offs is related to the subsequent use of spin-offs and to better financial performance. This finding suggests that divestiture information gleaned from sell-offs is tacit while that from spin-offs is explicit.

We develop an infinitely repeated model in which the owners, subsidiary managers, and outside buyers may have incomplete and tacit information about the subsidiary's profitability. In our model, private information is not given per se; in some cases there is no private information, but asymmetric information can result from the activity of divestiture depending on whether the divestiture is public or private and whether the information is tacit or explicit. Information can be asymmetric due to the choice of divestment option under tacit information.

Divestiture can be considered as a two-stage process. In the first stage, the parent company decides whether or not to divest a subsidiary. In the second stage, the parent company evaluates available divestment options and then selects the best one. Much of the prior literature on corporate divestiture focuses on the first stage and the main concern is usually whether the divestiture creates value. Some empirical studies take into account the differences among divestment options and identify its impact on empirical results. However, these studies often cannot explain why a parent company chooses a particular divestment option. We address the second stage—the selection of divestment options, taking as given the decision to divest a subsidiary. Once the firm has made the decision to divest its subsidiary, the owners assess the four most popular divestment options—sell-offs, spin-offs, carve-outs, and MBOs—and choose the best one. That is, while the literature focuses on *why* a firm divests a subsidiary, our study focuses on *how* the firm divests the subsidiary. As Eckbo and Thorburn (2008) have elaborated, "In this survey, we have focused on the individual transactions and their associated empirical evidence. This is also how most of the literature progresses. A major drawback of this approach is the resulting lack of analysis of alternatives. That is, when a company self-selects a divestiture, what were reasonable alternative strategies? In what sense was divestiture superior to, say, a spinoff or an equity carveout? … Ideally, one would use a theoretical model to structure the answers to these types of questions. Perhaps the greatest challenge to the restructuring literature is to achieve a modicum of integration of the analysis across transaction types. … We expect these issues to be resolved as both theories and data become more readily available in the future."

Empirical comparisons of divestment options abound in the literature (Michaely and Shaw, 1995; Slovin et al., 1995; Maydew et al., 1999; Nixon et al., 2000; Frank and Harden, 2001; Powers, 2001; Chen and Guo, 2005; Bergh et al., 2008; Bergh and Lim, 2008; Damaraju, 2008; Jain et al., 2011; Bergh and Sharp, 2015; Pham, 2012), but theoretical comparisons are few and far between (Khan and Mehta, 1996; Choi and Merville, 1998; Chemmanur and Liu, 2011). Empirical comparisons are restricted to observable and measurable factors, while theoretical comparisons are not. Factors such as risk aversion, incentives and asymmetric information are hard to observe and measure in empirical studies. Theoretical comparisons generally focus on the asymmetry of information between the owners and outside buyers. Choi and Merville (1998) investigate corporate acquisitions and divestitures in a unified agency framework where an agency parameter and a synergy parameter interact to determine the optimal organizational structure. They assume two separate production processes for the parent firm and a subsidiary, where the subsidiary's production process includes a synergy parameter. Chemmanur and Liu (2011) emphasize insiders' private information about firm value. They find that "insiders with the most favorable private information implement spin-offs; those with less favorable private information implement carve-outs; those with even less favorable private information implement tracking stock issues; and those with unfavorable private information remain consolidated." One crucial difference between our model and Chemmanur and Liu's is that they assume that the owners have perfect knowledge of the subsidiary's profitability while we do not. In fact, we think that one of the reasons for the owners to divest a subsidiary is so that they could discover the subsidiary's market value. This idea is consistent with that of Perotti and Rossetto (2007) who model carve-outs as a way for the parent firm to obtain information from the market about the value of the subsidiary. Bergh and Lim (2008) discuss the role of explicit and tacit information in their empirical study. For them, explicit and tacit information about the operating procedures of divestment options derives from past divesting experiences and is indirectly associated with the adoption of a particular divestment option. In our model, explicit and tacit information about the subsidiary's profitability is exogenous and is directly related to the choice of divestment option.

Our study is the first to consider all four popular options. In our model, it takes two periods to complete a divestiture and the value of the subsidiary is based on the expected value of future incomes after separation. We assume that the subsidiary managers have complete information about the subsidiary's profitability while the owners and outside buyers may have incomplete information. In addition, we assume that information about the subsidiary's profitability may be explicit or tacit to the owners and outside buyers. Further, although prior literature such as Chemmanur and Liu (2011) often assumes risk neutrality for the parties involved, risk

[1] Tacit information requires skills, knowledge and experiences to digest and utilize it effectively. In our paper, it means the need for a time to fully understand the information. In prior literature, there are many empirical studies on the measurement of tacit information, such as Leonard and Insch (2005), Insch et al. (2008), and Mehta (2016).