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Why do firms engage in selective hedging? Evidence from the gold mining industry ☆

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ABSTRACT

The widespread practice of managers speculating by incorporating their market views into firms' hedging programs ("selective hedging") remains a puzzle. Using a 10-year sample of North American gold mining firms, we find no evidence that selective hedging is more prevalent among firms that are believed to possess an information advantage. In contrast, we find strong evidence that selective hedging is more prevalent among financially constrained firms, suggesting that this practice is driven by asset substitution motives. We detect weak relationships between selective hedging and some corporate governance measures but find no evidence of a link between selective hedging and managerial compensation.

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We don't hedge just to say we're hedged, we hedge to make money – Chesapeake Energy Corporation, as reported in a June 4, 2012 *Wall Street Journal* article "Hedges Gone Awry Set Back Chesapeake" on Chesapeake's recent selective hedging loss exceeding $750 million.

1. Introduction

Surveys of corporate hedging programs provide extensive evidence that firms around the world routinely speculate within the context of their hedging programs by varying the size and the timing of their derivatives transactions based on managers' market views, a practice known as "selective hedging."[3] For example, Bodnar et al. (1998), and Glaum (2002) report that the majority of firms in their respective surveys at least sometimes base the size

[3] We use the terms "selective hedging," "market timing" and "speculation" interchangeably in the paper.

of their hedges on their views of future market movements. Faulkender (2005), Adam and Fernando (2006), Brown et al. (2006), and Géczy et al. (2007) also provide empirical evidence that is consistent with selective hedging.

The traditional theories of corporate risk management provide no shareholder value-maximizing rationale for firms to engage in selective hedging. However, this literature provides numerous theoretical arguments in support of the notion that hedging corporate risk by passively matching one risk exposure with an opposing risk exposure creates value for shareholders by mitigating market imperfections that cause departures from a Modigliani–Miller world. First, hedging can reduce firms' expected costs of financial distress (Smith and Stulz, 1985). This argument also suggests that hedging will help firms increase their debt capacity and the tax shields they can realize from debt (Leland, 1998; Graham and Rogers, 2002). Furthermore, by reducing the cost of financial distress, hedging can also enhance credit quality and reduce the cost of debt financing (Chidambaran et al., 2001). Second, when a firm faces a convex tax function, lowering the volatility of earnings by hedging can help reduce a firm's expected tax burden (Smith and Stulz, 1985; Graham and Smith, 1999). Finally, growth firms that find external financing to be more expensive than internally generated funds could employ hedging practices to reduce the underinvestment problem by ensuring that they have sufficient internal funds available to take advantage of attractive investment opportunities (Froot et al., 1993) and by reducing the cost to equity holders of financing these investment opportunities externally (Bessembinder, 1991).

In contrast to passive hedging, selective hedging entails managers actively varying the size and timing of their derivatives transactions based on managers' market views. Stulz (1996) proposes a modified theory of corporate risk management, which sets out the two economic criteria that must be satisfied for firms to create value for their shareholders by engaging in selective hedging. First, firms must possess an information advantage relative to the market to add value through market timing. Second, firms need sufficient financial strength to take additional speculative risks based on this information advantage without jeopardizing their core business. To our knowledge, there has been no attempt in the literature to relate the practice of selective hedging to these criteria for value enhancement. Moreover, there has been no investigation of the alternate possibility suggested by Stulz (1996) that, even in the absence of private information, financially distressed firms can be motivated by an asset substitution incentive to engage in selective hedging.[4]

Our research fills this gap in the literature by examining the above questions in the context of the gold mining industry, which has been served as a laboratory for several studies of corporate hedging practices due to the availability of high-quality derivatives usage data.[5] The gold mining industry is also a particularly good industry to study selective hedging because gold prices are determined by supply and demand in a global market that is largely financially integrated (See, for example, Lucey et al. (2014)). The period we examine (1989–1999) is a relatively calm period in terms of gold prices but active in terms of changes in hedge ratios (see Fig. 1). Thus, changes in gold prices do not drive any abnormal changes in hedge ratios that we interpret as selective hedging because gold prices are relatively flat during our sample period. Alternatively, low gold prices imply that firms are under more pressure to make money by selectively using derivatives because gold mining firm revenues are in large part determined by spot prices unless firms are selectively using derivatives.

We find that the extent of selective hedging is positively correlated with a firm's future stock return volatility, which suggests that selective hedging increases risk as surmised by Stulz (1996). We also find a negative relation between selective hedging and firm size, implying that smaller firms speculate more than larger firms. This result stands in stark contrast to our findings for firms in the same sample (and by other researchers in several prior studies) that larger firms are more likely than smaller firms to use derivatives and hedge a higher fraction of their exposure. In robustness checks, we find similar negative relations between selective hedging and two other measures of a firm's footprint in the gold market – its annual gold production and its total gold reserves. In the gold mining industry, firm size, gold production, and gold reserves are all likely to be positively correlated with an information advantage with respect to the aggregate gold production and hence the future gold price. We also find that selective hedging is negatively related to firm age and CEO tenure, both potential alternate information advantage proxies.

In addition, we find a negative relation between selective hedging and the probability of financial distress, as measured by either Altman's (1968) *Z*-score or Ohlson's (1980) *O*-score. Firms with the highest probabilities of bankruptcy tend to speculate the most, which is consistent with Stulz (1996)'s prediction for uninformed firms. These results are the opposite of what one would expect if selective hedging were adding to firm value. Instead, they are consistent with the classical asset-substitution problem first articulated by Jensen and Meckling (1976) and applied to the context of selective hedging by Stulz (1996) and Campbell and Kracaw (1999) as a rationale for more financially constrained firms to engage in activities that increase their risk exposure.

Our findings that firms who are (a) likely to be least informed (smallest) and (b) are closest to financial distress speculate the most should be disconcerting to shareholders and regulators, especially in light of the evidence we provide in this paper that selective hedging increases riskiness, and the evidence provided in previous studies that taking on this additional risk does not provide shareholders any added return even disregarding the cost of managerial time and other resources that selective hedging consumes.[6]

Our findings naturally raise the question of how selective hedging is related to corporate governance. While our overall evidence on this question is weak, the strongest evidence we uncover is a positive relation between the extent of selective hedging and board size. This finding is consistent with the argument (see, for example, Yermack (1996)) that larger boards are less effective than smaller boards. Another related possibility is that the board puts compensation structures in place that perhaps inadvertently encourage some managers to speculate. For example, Géczy et al. (2007) find that the sensitivity of CFO compensation to stock returns (delta) is positively associated with the probability of actively taking positions (although they find a negative relation for CEOs), In contrast, we find no evidence to suggest that selective hedging in our sample of firms is motivated by managerial compensation structures. This leaves open the question of why managers at smaller firms engage more in selective hedging than managers at larger firms.

[4] Campbell and Kracaw (1999) also develop a model where financially constrained firms have an incentive to increase risk exposure.

[5] We study the derivatives usage strategies of a sample of 92 North American gold mining firms between 1989 and 1999, collected by Ted Reeve of Scotia Capital. This dataset has been extensively whetted in previous studies of the corporate use of derivatives, including Tufano (1996, 1998), Adam and Fernando (2006), and Brown et al. (2006). To our knowledge the gold mining industry is the only industry where the data is available in sufficient detail at quarterly intervals to enable a systematic study of corporate speculation with derivatives. Mr. Reeve discontinued his data collection in 1999, which limits our study to the 10-year period ending 1999.

[6] See, for example, Adam and Fernando (2006) and Brown et al. (2006). To the extent there are scale economies associated with setting up a selective (as opposed to a passive) hedging program, it is surprising also to see smaller firms engaging in more selective hedging than larger firms.

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