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## Effect of derivative accounting rules on corporate risk-management behavior<sup>☆</sup>

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### ABSTRACT

I examine the effect of the accounting standard for derivative instruments (SFAS No. 133) on corporate risk-management behavior. I classify a derivative user as an “effective hedger” (EH firm) if its risk exposures decreased after the initiation of the derivatives program, and as an “ineffective hedger/speculator” (IS firm) otherwise. I find that volatility of cash flows and risk exposures related to interest rate, foreign exchange rate, and commodity price decrease significantly for IS firms but not for EH firms, suggesting that IS firms engaged in more prudent risk-management activities after the adoption of SFAS No. 133.

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### 1. Introduction

In 1998, FASB issued *Statement of Financial Accounting Standards* (SFAS) No. 133, *Accounting for Derivative Instruments and Hedging Activities*. As the primary directive with respect to accounting treatment for derivatives in the U.S., SFAS 133 requires that entities record all derivatives as either assets or liabilities at fair value and recognize unrealized gains or losses due to changes in fair value in their income statements. However, while prescribing fair value accounting in general, the standard allows special accounting treatment for derivatives that qualify as effective hedge instruments. Specifically, under hedge accounting, a company can record the changes in fair value of an effective hedge instrument and the changes in fair value of the underlying hedged item in the income statement simultaneously. Thus, only the ineffective portion of the hedge instrument affects a company's net income.<sup>1</sup> The objective of this study is to examine whether the changes to the recognition and disclosure requirements for derivative instruments mandated by SFAS 133 has had an effect on corporate risk-management behavior.

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<sup>1</sup> Please see Section 2.1 for a more detailed discussion on the accounting treatment for derivative instruments.

The introduction of SFAS 133 has generated intense debate over how derivatives accounting affects firms' risk-management activities. Proponents of the standard maintain that derivatives create new risks that are not appropriately disclosed or recognized under historical-cost accounting and that fair value-based recognition makes the use of derivatives more transparent, encouraging prudent risk management. This view is supported by the theoretical finding of Melumad et al. (1999), who illustrate that hedge accounting with fair value measurement can reveal a firm's underlying risk exposure and thereby induce the first-best hedge choice, as in a setting with no asymmetric information. In contrast, opponents of the standard insist that firms mainly use derivatives to hedge their inherent business risk and that fair value measurement potentially leads to higher short-term earnings volatility in the financial statements. This may deter the legitimate use of derivatives for hedging purposes. Investigating this issue from the capital market valuation perspective, Saprà (2002) reaches a similar conclusion. His model shows that an extreme position in the derivatives market signals favorable private information about the firm's future spot price, which, in turn, leads to a higher capital market price. Saprà's findings suggest that increased reporting transparency (resulting from SFAS 133) may actually induce a firm to take an excessive speculative position.

While the controversy relating to SFAS 133 centers on how it affects firms' risk-management activities, extant empirical evidence focuses on earnings volatility rather than firms' real actions. For example, Singh (2004) and Park (2004) find no significant change in earnings volatility after the adoption of SFAS 133. Both papers conclude that the impact of SFAS 133 may not be as significant as claimed. However, while the change in earnings volatility may be a relevant issue, it is important to differentiate the effect of SFAS 133 on short-term earnings volatility assuming firms' risk-management behavior remains unchanged<sup>2</sup> and the effect of SFAS 133 on firms' risk-management behavior. According to the hedge accounting treatment specified in SFAS 133, unrealized gains or losses of the hedging instrument can be offset by unrealized losses or gains of the hedged item in the income statement. Hence, only the ineffective portion of a hedging instrument is reflected in contemporaneous earnings if hedge accounting is adopted. However, if the increase in earnings volatility is material and costly and a firm adjusts its derivatives portfolio in anticipation of this potential cost,<sup>3</sup> no increase in earnings volatility will be observed following the adoption of SFAS 133.

In this paper, I separately analyze firms that successfully reduce their inherent risk after holding derivative instruments (effective hedgers) and firms that fail to reduce their risk exposure after initiating derivatives programs (ineffective hedgers/speculators). I first provide evidence on whether firms changed their risk-management activities after the adoption of SFAS 133 and then examine changes in earnings volatility and cash flow volatility given the changes in risk-management behavior.

Since the inherent business risk for firms with derivative positions is unobservable, I follow the "new user" approach proposed by Guay (1999) and classify new derivative users as either effective hedgers (EH firms) or ineffective hedgers/speculators (IS firms).<sup>4</sup> First, I identify a sample of 225 non-financial firms that initiated their derivatives programs during the period of 1996–1999. Next, following previous literature (Wong, 2000; Guay, 1999; Geczy et al., 1997), I estimate new derivative users' exposure to (i) interest rate, (ii) foreign currency exchange rate, and (iii) commodity price risk for each of the following three periods: the period before the initiation of the derivatives program (period 1), the period after the initiation of the derivatives program but before the adoption of SFAS 133 (period 2), and the period after the adoption of SFAS 133 (period 3). I classify a firm as an effective hedger (EH firm) if its exposure to a given risk is lower than the expected level after the initiation of the derivatives program, and as an ineffective hedger/speculator (IS firm) if its exposure is higher than the expected level after the initiation of the derivatives program, where information about new users prior to the initiation of the derivative program (period 1) is used to estimate the expected level of new users' risk exposures. This classification criterion is based on whether firms successfully use derivative instruments to reduce their risk exposures and therefore does not differentiate speculators from ineffective hedgers. Since SFAS 133 requires companies to document their hedge effectiveness both prior to entering derivative contracts and periodically thereafter to qualify for hedge accounting treatment, the impact of the accounting standard on firms' financial statements is the same for firms that intend to speculate and for firms that intend to hedge (establish hedge effectiveness ex-ante) but end up holding ineffective hedging instruments (fail to establish hedge effectiveness ex-post). Finally, I examine changes in the three types of risk exposure after the adoption of SFAS 133 for EH firms and IS firms separately.

For IS firms, I find a significant reduction in all three types of risk exposure during the post-SFAS 133 period as compared with the pre-SFAS 133 period after controlling for other related risk factors and potential changes in firms' incentives to hedge/speculate. In contrast, I find no significant change in any of the three types of risk exposure for EH firms. Next, I find that cash flow volatility for IS firms significantly decreased relative to that for EH firms after the adoption of SFAS 133, consistent with changes in risk exposure. However, I find no significant change in earnings volatility for either EH firms or IS firms after controlling for the contemporaneous change in cash flow volatility. Since earnings are affected by both real

<sup>2</sup> Hodder et al. (2006) and Barth et al. (1995) find that the volatility of annual income after incorporating changes in the fair value of financial instruments is significantly higher than the volatility of annual income measured with historical cost accounting.

<sup>3</sup> Austin et al. (1995), Subramanyam (1996), and Defond and Park (1997) find that managers make accounting choices (at least in part) to reduce earnings volatility. The survey evidence in Graham et al. (2005) suggests that managers sometimes manage real activities to reduce earnings volatility. Barton (2001) documents that managers use hedging instruments and discretionary accruals as partial substitutes to smooth earnings.

<sup>4</sup> Using a sample of non-financial firms that initiated their derivatives programs in the early 1990s, Guay (1999) finds that risk exposures of these new users decrease significantly after the initiation of the derivatives program and concludes that, on average, firms use derivatives to hedge.

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