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## Credit enhancement through financial engineering: Freeport McMoRan's gold-denominated depositary shares<sup>☆</sup>

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### Abstract

In 1993 and 1994, Freeport McMoRan Copper and Gold issued two series of gold-denominated depositary shares to finance the expansion of its mining capacity in Indonesia. The pricing of these securities reflected their enhanced credit quality, which arose from the positive correlation between the value of the firm and the value of the securities. This feature of the securities effectively bundles a gold hedge with financing. A bundled hedge avoids wealth transfers to senior bondholders, since junior bondholders can effectively net their bond-related claims on the firm against their hedge-related liability to the firm. Such securities cannot be replicated by conventional hedging strategies, and they also mitigate the asset substitution problem. © 2001 Elsevier Science S.A. All rights reserved.

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## 1. Introduction

In 1993 and early 1994, Freeport McMoRan Copper and Gold Inc. (ticker symbol FCX) faced a substantial challenge in financing the expansion of its Grasberg gold and copper mine in Irian Jaya, Indonesia. The mine, high in the mountains, was the world's largest gold reserve and one of the largest copper reserves. FCX needed to invest heavily to expand mine capacity and achieve the economies of scale required to become more competitive. Despite a heavy debt burden and a stock that was trading below the value of its assets, FCX successfully raised \$359 million at a favorable financing cost through two series of gold-linked depositary shares backed by preferred stock. These claims enjoyed an enhanced credit quality because the link to gold prices credibly reduced default risk. We show that the design of the security allows the benefits of this credit enhancement to be targeted to the purchasers of the newly issued securities.

The gold depositary shares issued by FCX are similar to a debt instrument that has all interest and principal payments in gold. Other gold-mining companies have also employed gold-linked financing to combine financing and risk management needs. Tufano (1993) describes these instruments in general and the activities of American Barrick in particular. The use of these hybrid instruments creates a liability whose value is positively correlated with the value of the firm, thereby enhancing the credit quality of the depositary shares and enabling FCX to finance its expansion at a lower cost despite being financially constrained. Reducing the costs associated with binding financial constraints can be value increasing (see Smith and Stulz, 1985; Stulz, 1990; Froot et al., 1993; Mello and Parsons, 2000).

A gold-denominated depositary share is a financing instrument with an embedded derivative that serves to hedge the exposure to gold price risk. In this paper, we show how this financially engineered security creates value beyond what can be achieved by conventional derivatives strategies. Our approach is as follows. We first establish the credit enhancement of the gold-denominated depositary shares relative to straight bonds. We then contrast *bundled* hedging, or financing bundled with an embedded derivative, with *conventional* hedging, or the standard risk management strategy of issuing a straight bond and simultaneously initiating a hedge using derivative contracts. The effects of the two strategies appear on the surface to be identical. We show that this apparent equivalence is deceptive and that bundled hedging is vastly superior to conventional hedging.

The superiority of a bundled hedge arises from two effects. First, using financial engineering to bundle financing and hedging prevents wealth transfers to senior bondholders that arise in the case of a conventional hedge. Bundling allows the holders of the hybrid security to (effectively) offset the amount they owe on the bundled derivative contract against the amount they stand to lose on

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