

LESSONS ON HEDGING

How gold miners and financial institutions have learned to cope with risk.



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THERE ARE MANY METHODS OF BALANCE SHEET MANAGEMENT, BUT THE MOST COMMON APPROACH INVOLVES DETERMINING WHICH VARIABLES HAVE THE LARGEST EFFECT ON THE VALUE OF YOUR ASSETS AND LIABILITIES.

Risk management practices have evolved considerably over the last 50 years. Traditional cash-flow matching and short-term hedging schemes proved to be unreliable. In the gold mining industry, risk was managed a year at a time by hedging the current sale price of gold. But this short-term hedging did not control the long-term risks of the firm. In the banking sector, a traditional GAP management approach which matched cash flows over the foreseeable future failed in the U.S.

savings and loan crisis when it turned out that traditional sources of funding were no longer available to the S&Ls.

While still in use, traditional risk management approaches have been supplemented with what is called balance sheet risk management. In this approach the risk manager attempts to ensure that the present value of the assets and the liabilities are always the same. This may seem a paradoxical idea, since by definition the accounting values of assets and liabilities are always the same—the balance sheet always balances. For a gold mining company, this means that the entire anticipated future production of the gold mine must be sold forward thus locking in the future revenue stream of the mine. This turns the gold mine into something more like an annuity, subject only to the relatively less important uncertainties about production costs and foreign exchange rates. This is a much better match for the mines' funding, which is largely debt. For the bank balance sheet, good management involves making sure that the value

of the loan (or the present value of the future income stream from the loan) always matches the present value of the payments that must be made on the deposits (the funding for the loans).

There are many methods of balance sheet management, but the most common approach involves determining which variables have the largest effect on the value of your assets and liabilities. You then try to ensure that both assets and liabilities are equally sensitive to these variables. For the gold mine, the most important variable affecting the value of the assets is the price of gold, while the liability's value is most affected by the level of interest rates. Rising and falling gold prices raise and lower the asset value while the liability value remains largely unchanged. The solution is to take on additional assets, the forward contracts, which change the sensitivity of asset values to changes in the price of gold.

For a pension plan, the assets are the fund investments, while the liabilities are the pension benefits that must be paid. Analysis reveals that for a defined benefit pension plan, the most significant sources of risk for the present value of the plan's liabilities are the level of interest rates and the level of inflation. To manage this risk in a balance sheet framework the optimal strategy would be to invest in a set of assets with the same risk sensitivities. The set of assets with risk properties most similar to the properties of the liabilities is a portfolio of nominal and real return bonds. Such an investment would almost certainly cover the liabilities of the fund as they matured. However, it would be an expensive solution to the problem, a solution few funds are willing to purchase. Most funds invest in assets whose risk characteristics do not match the risks of the liabilities in an attempt to reduce the cost of funding the pensions. ■