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About the Section on Energy & Natural Resources Law

Since its formation in January 1983 the IBA's Section on Energy & Natural Resources Law (SERL) has become the foremost forum for international energy and resources lawyers providing the opportunity for lawyers world-wide to exchange views and professional expertise and information.

Membership

Over 1,400 lawyers from industry, private practice, government, academic and international organisations belong to SERL. All members must also be members of the IBA, the largest international legal organisation in the world with 131 member Bar Associations and Law Societies and over 15,000 individual lawyer members in 130 countries.

Aims

SERL and its specialist Committees listed below aim to advance the development and understanding of the law as it affects oil, gas, coal, electricity, nuclear and other mineral and energy resources both nationally and internationally and to conduct programmes for the continuing education of its members and other lawyers concerned with natural resources law.

The Section maintains liaison with various national and international organisations.

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The major focus of SERL's activities is the organisation of a continuing series of advanced five-day seminars on legal aspects concerning the petroleum, minerals and energy resources industries.

In addition to these major international seminars the Section stages specialist regional seminars which concentrate on current topics and issues of importance in particular parts of the world and meets at IBA conferences.

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Regional groups have been established under the auspices of the Section in the United Kingdom and Germany; group members meet on a regular basis to discuss topical issues in their country.

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- Gas Law (G)

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The Section publishes the quarterly *Journal of Energy & Natural Resources Law* which is received as one of the benefits of membership by all SERL members. The *Journal* provides an authoritative analysis of major issues in energy and natural resources law with comprehensive coverage of legal developments, literature and research around the world.

Membership news and details of current Section activities are reported in the *International Bar News* published four to five times each year and distributed to all IBA members.

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- Personal contacts throughout the world
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TOPIC 1

Price Risk Management

The Problems of Price Risk

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Mr Don M. Morley was born in Brisbane on 11 February 1940. He graduated from the University of New South Wales in 1965 with a BSc in Metallurgy, and from the University of Chicago in 1970 with an MBA.

Mr Morley worked as a metallurgist in Australia, Canada and the United States prior to joining Western Mining in 1970 as a financial analyst. He was appointed General Manager – Finance & Treasurer of Western Mining in 1980. In 1983 he was appointed Director of Finance, and has since been appointed to his present position of Director of Finance & Administration.

He is a Director of Alcoa of Australia Ltd and Central Norseman Gold Corporation Ltd.

He is involved in a wide range of other professional activities. These include positions as Councillor and Honorary Treasurer of the Australasian Institute of Mining & Metallurgy, member of the World Gold Council and member of the Business Council of Australia.

Synopsis

For a commodities producer price risk is the effect of sudden and unpredictable changes in prices on the short and long term functioning of the business.

The history of commodity price trends is one of real falling prices over time so the producer *must* keep getting smarter if he is to survive. Commodities producers cannot generally differentiate between their products except on the basis of price, i.e. no brand names.

Producing units – mines, oilfields, etc – have lives of 10, 20 and up to 50 years or more. Mechanisms do not exist to influence prices over this time. Therefore the producer must influence the controllable factors which are costs, to minimise the impact of price risk.

Instruments have been developed to even out price volatility over the short term. These can assist in minimising volatility of profits. However the nature of the commodity markets is one of extended periods of low prices interspersed with periods of very high prices. If hedging is not done well or luckily the producer may miss out on the high price and hence reduce the overall return on his business.

1. What is the Problem of Price Risk?

The problem of price risk is defined as "the effect of sudden and unpredictable fluctuations in prices of minerals and energy commodities on the short and long term functioning of the business". This paper explains what these risks are and, from the perspective of a commodity producing company, how to best manage price risk.

The commodities business operates according to classical economics – where prices rise or fall until the market is cleared. In other words commodity producers compete on the basis of price, unlike manufacturers of consumer goods where brand name, level of service, distribution methods or quality are more important.

The difference between the two types of businesses is highlighted by the fact that the prices for most manufactured and consumer goods from a given supplier do not vary greatly – certainly not from day to day like they do in the oil and minerals industries.

A related risk factor is the exchange rate which can have as much impact on price volatility as the supply/demand relationship. The exception is for the US domestic producer, since most commodities are priced in US dollars. Table 1 highlights the various dimensions of price risk for a commodity producer.

TABLE 1: Price Risk Factors for Commodity Producers

1. Volatility – prices can vary by $\pm 50\%$ over short periods of time due to fluctuations in:
 - supply/demand relationships, and
 - exchange rates, particularly for non-US based producers.
 2. Timing of new investments in relation to the business cycle.
 3. The impact of price volatility (risk) on earnings is critically dependent on the cost of production. By definition, low cost producers have better profit margins and so are less exposed to variations in price, because they are better able to withstand long periods of low prices.
 4. It is difficult for most commodity producers to pass on price volatility (risk) to others via hedging, long term stable price contracts, etc., though this may be changing. The periodic price spikes, which are a feature of the commodities business, are essential to the producer obtaining an adequate rate of return on its investment over the business cycle. If you hedge away the price spikes you must get an above average price for the rest of the business cycle.
-

(a) *Is Hedging the Solution?*

In the short term it is possible to manage price volatility by hedging. However, a commodity producer must carefully consider whether or not it is in the best interests of its shareholders to use this means to off-set price volatility.

The key concerns are:

- With the exception of oil and gold it is difficult to sell forward production more than one or two years.
- In practice, most companies are reluctant to hedge as, when prices are high, they must accept a significant backwardation and forego potential profits and when prices are low, they don't like locking in low prices.
- Over the total price cycle, if you do not hedge you will get the average price and that should be satisfactory if you are a low or medium cost producer.
- There is a significant mismatch between a producer and a consumer of a commodity. Consumers may well find that hedging enables them to lock in a profit margin for the sale of their product. This doesn't apply to a producer as, by hedging, he is generally taking an opportunistic view that he knows more than the market.
- Commodity producers invest in assets – whether they be mines, processing plants or oil fields – with lives of 10, 20 and up to 50 years or more. Consequently the producer is always exposed to price variations as it is not possible to hedge out this far.
- There has been much discussion as to whether a company should not hedge its prices on the basis that shareholders have purchased the shares in the company because they want to participate in that risk.
- When contemplating the purchase of a piece of equipment, or import of foreign goods, it is in the interest of the buyer and seller to lock in the cost of the investment by hedging the interest rate, or the foreign exchange needed to buy the goods in question on delivery in say 3, 6, 12 or 24 months time. The “hedger” is dealing with the *whole* life of the transaction. Hedging the long term *selling price* of a commodity is quite different to hedging the short term buying of a capital good, operating cost or service.
- Hedging is often an expensive form of insurance policy as the forward price is often less than the prevailing spot price. In technical terms this is called price *backwardation*. In some cases the opposite can occur where the forward price is *higher* than the spot price. This is known as a *contango* (Figures 1 to 3 show the contango/backwardation relationships for gold, oil and aluminium over the past two years).
- The commodity you produce may not correspond exactly to the commodity sold on the futures market and as a result there may be a mismatch in prices over time. The technical term for this is basic risk. For example, the quality/price differential for West Texas Intermediate (WTI) oil versus Brent or other crudes can and does vary over time.

From the above it is clear that hedging, by itself, is only a partial solution to overcoming price risk in the commodities industry. For long term survival the producer must focus on its cost position relative to other companies and the prevailing price.

The interrelationship between prices and production costs are discussed in the following two sections.

2. Trends in Commodity Prices

For commodity producers, the most important feature in selling the product is price, hence price variability (or risk) for a commodity producer is of major importance. However it is also the factor over which the least control can be exercised.

Figure 4 shows the movement in aluminium prices over the last 20 years in both dollars of the day and constant 1991 prices. It highlights three features common to most commodities, namely:

- 1) extended periods of low prices, punctuated by short term price hikes.
- 2) extreme volatility in prices, with a ± 50 per cent change over a year not uncommon.
- 3) a gradual downwards trend in real prices over time.

The last point becomes more evident when you look at aluminium over the last eighty years (Figure 5). On average, over this period, aluminium prices trended downwards by two per cent per annum in real terms. This was driven by improvements in technology and economies of scale which helped lower production costs which, in turn, due to competition, led to lower prices to the customer.

To maintain profit margins the existing producer will be required to lower real costs at an even greater rate.

The corresponding price histories of oil, copper, nickel, lead, zinc and gold are given in Figures 6 through to 11. As can be seen many of these commodities show a similar long term decline in real prices.

Figure 12 shows that, on a weighted average basis real metal prices have declined on average by 1.5 per cent per annum over the last 30 years.

From the above analysis it is clear that one should always take a conservative view of future price forecasts. Price spikes are always shorter than expected, the troughs are always longer than one would like, and (unless there are good fundamental reasons to the contrary) real prices will continue to fall in the longer term. The end result is that the commodities business for the miners and minerals processors has an inherently high price risk.

For some commodities a particular market segment may be or is likely to become dominant (stainless steel for nickel producers and packaging for aluminium). When this happens extreme price volatility may cause the demand for a commodity to slow down if the market and investment risk for the commodity user is perceived to be too high. Clearly for nickel and aluminium a more stable price (that is, lower metal price risk) may be beneficial to both producers and customers. How this problem can be solved is likely to get increasing attention over the next decade.

As a commodity moves down the value-added chain it generally becomes part of another manufactured product – for example, aluminium is only a small cost in the selling price of a can of beer. Hence the high price risk of the original miner is not necessarily a major factor to users of the product.

3. The Effect of Production Costs

As a producer cannot influence the long term price of a commodity attention

must be directed to the one factor that it does have control over – namely production costs.¹

A commodity producer should aim to remain at the bottom end of the cash cost curve – as in doing so the business will be less at risk from price volatility.

This also makes the producer better placed to meet any debt servicing obligations. It is critical for a commodities producer to restrain debt to modest levels as high gearing and onerous debt servicing obligations can be disastrous.

(a) Case Study: Copper Industry

A good example of the need to control costs in the face of fluctuating metal prices can be found in the western world copper industry.²

Figure 13 shows the cumulative capacity available in 1990 for the world copper industry ranked on an ascending cost basis. For convenience the cash cost curve can be broken up into quartiles.

Plotting costs for each of the quartiles over time shows an interesting trend with real unit operating costs falling by half over the last 15 years (Figure 14). This was due to several factors including the introduction of new technology (such as solvent extraction-electro winning) and better productivity, coupled with closing down older/higher cost mines.

Figure 15 highlights the corresponding trend in real copper prices over the same period. As can be seen, over the last 15 years copper prices have also fallen by one-third. The result is that much of the producers' cost savings have been passed onto the customer in the form of lower prices.

Figure 15 also highlights the fact that the industry is dynamic – as one's relative position on the cost curve will be affected by what others do. A related problem is that the cost structure will be affected by changes in debt, exchange and inflation rates as well as input costs such as labour and energy. A highly efficient producer in 1975 would be a marginal producer in 1990 if it had not kept up with improvements in technology and productivity.

If copper prices fall to the levels predicted by Brook Hunt there are going to be several producers leaving the industry over the next few years. The forecast price collapse is partly driven by companies' reluctance to shut down because of the once-off costs involved and governments' enthusiasm to prop-up loss-making industries for social reasons. Conversely when demand picks up, it also takes time to restart old projects and build new mines. This only accentuates price volatility.

The same general trends are also happening for many of the other major commodities.

To survive the increasing price risk commodity producers have to continuously improve their productivities and keep debt to a minimum or face the risk of going bankrupt.

4. Western World Real Price to Cash Cost Relationships

Table 2 summarises the relationship between real prices and cash costs (excluding, depreciation, interest and taxes) by a producer's position on the copper cost curve (that is, bottom quartile to top quartile).

¹ Cash production costs may be divided into two parts: namely direct cash operating costs and debt servicing obligations.

² Information in this section is based on data provided by the consulting firm Brook Hunt & Associates.

TABLE 2: Ratio of Real Price to Costs for the Western World Copper Industry

| <i>Year</i> | <i>1st Quartile</i> | <i>2nd Quartile</i> | <i>3rd Quartile</i> | <i>4th Quartile</i> | <i>Average Real Price c/lb in 1991\$</i> |
|-------------|-------------------------|-------------------------|-------------------------|-------------------------|--|
| 1977 | 2.1 | 1.7 | 1.2 | 1.1 | 146 |
| 1980 | 3.8 | 2.1 | 1.6 | 1.2 | 160 |
| 1985 | 2.6 | 1.8 | 1.4 | 1.1 | 82 |
| 1990 | 3.3 | 2.2 | 1.7 | 1.4 | 126 |
| 1995 | 2.4 | 1.5 | 1.2 | 1.1 | 80 |

This Table shows that the best copper producers typically have revenues two or more times higher than their cash costs (assuming zero debt). Also that copper producers with a long term ratio of real prices to cash cost (assuming zero debt) of 1.5 or higher should generally be able to survive in an environment of \pm 50 per cent change in real copper prices unless they have to service very high debt levels. Producers in the third and fourth quartiles will tend to continue making small to large scale losses and end up going out of business or changing their operating practices – particularly those with high levels of debt.

Confirmation of this can be seen in Figure 15 which compares the trend in copper costs versus selling price between 1975 and 1995. For seven out of the last 15 years the upper quartile producers have lost cash on the copper they sell. This is before taking account of any debt servicing. Clearly, they have a very high exposure to price risk.

In contrast the lower quartile and median copper producers were nearly always cash positive – even in the worst recession. The bottom quartile producers have been reasonably sure of getting a steady cash flow. Similar studies indicate that the same rules of thumb seem to apply for other selected commodities.

5. Key Controllable and Uncontrollable Factors Influencing a Producer's Position on the Cost Curve

To minimise price risk in the commodities industry the producer has to focus on those factors which he has control over – namely:

- Quality of resource – location, grade complexity, size and depth
- Technology – access to or changes in technology
- Management's ability to control costs via a productive organisation
- The level of debt
- Type of debt – financing debt in the same currency as the currency in which the commodity you are producing is sold provides an element of natural hedging
- Mix of commodities – commodities price cycles do not all coincide, hence