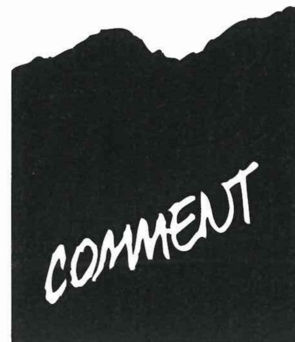
ception. India has initiated talks with the USA at very high official levels. Five rounds of talks have already taken place. The talks have converged on India signing the CTBT in its present form while India has suggested a few modifications in the draft. How long this is likely to take is a matter of inference only but the delay is taking a heavy toll of economic development of the country.

Notes

1. Preliminary Estimates of the Ministry of Industry and Finance Ministry of the Government of India.

2. Planning Commission, Government of India.

3. Ministry of Coal, Government of India. ■



Mining industry myths in the making

by Phillip Crowson

It has been argued that the privatisations of recent years will increase the responsiveness of supply to falling prices. That is because privately owned mines are dominated largely by the profit motive, rather than by the conflicting objectives of state owned companies. This comment disputes that conventional wisdom. Privately owned mines have complex and conflicting objectives and constraints that often override the quest for short-run profit maximisation. Because of the high prices that were often paid for state-owned assets, and the performance targets attached to privatisations, privatised companies have strong incentives to raise and/or sustain their output, irrespective of the supply-demand balance. Paradoxically, therefore, privatisation could lead to increased, rather than reduced price volatility.

Phillip Crowson is a board member of the London Metal Exchange, honorary professor, Centre for Energy, Petroleum and Mineral Law and Policy and former chief economist, Rio Tinto plc. Fax: +44-1737-249643.

During the 1970s, and well into the 1980s, a substantial share of the world's output of most major minerals came from state-controlled or state-owned companies, It was then widely argued, an especially in North America, that this introduced unnatural rigidities into mineral supply. The claim made was that state-owned companies had a variety of objectives that encouraged the maximisation of turnover and employment, rather than the profitability pursued single-mindedly by privately owned companies. Thus, the former tended to maintain, or even increase, their output when markets weakened and prices fell, thereby accentuating and prolonging the periods of price weakness. Privately owned companies, in contrast, were acutely conscious of the impact of their output decisions on overall market balance and carefully tailored their production to meet varying demand. So-called 'social metal' was regarded as a major contributor to the prolonged excess capacity and low prices of the decade or so following the collapse of the 1972–74 boom.

The argument is now being taken a stage further. It is claimed in some quarters that the widespread privatisations of minerals production in recent years are reversing the tide of 'social metal'. The newly privatised companies are now far more responsive to market conditions than when they were state-owned, and far more ready to lower their production, or even close temporarily when prices weaken sharply relative to marginal costs. There are no longer multiple objectives, nor governments urging the maintenance of output and employment. The comforting corollary is that supplies will adapt far more quickly to demand than in the recessions of the 1970s and 1980s, so that periods of weak prices will be much briefer, and possibly less pronounced. Much of the argument has concerned copper, but it presumably applies equally to other minerals.

It is great pity that the evidence about any insidious effects of 'social metal' from the period when state-owned companies did dominate global production is far from conclusive. Equally there is no firm evidence, other than wishful thinking, to support any cosy conclusions about the effects of privatisation.

The mining industry, however, seldom lets inconvenient facts intrude on its cherished beliefs. The bald truth has always been that all mining companies, regardless of the nature of their ownership, are driven by a range of objectives and constraints. Decisions about the level of output of individual mines are governed by a wide range of factors, throughout the price cycle, of which the most important include the characteristics of their ore deposits and perceived relative costs. The collapse of the Bretton Woods system of fixed exchange rates in the very early 1970s, the development of effective anti-trust legislation in Europe during the 1970s, the progressive elimination of tariffs and other barriers to trade, and the growing importance of consumption outside the traditional regions of North America and Western Europe, had a greater impact on production decisions than state ownership.

Where state-owned producers have accounted for a substantial share of world production they have long been aware that their decisions can influence the market balance. In most products anti-trust laws against collusion have for several decades prevented privately owned companies from exerting such market power. Subject to varying constraints, most private sector producers have sought to maximise their profits throughout the business cycle, usually regardless of the impact of their actions on global balances between supply and demand. Lower cost producers have always been able to withstand periods of weak prices that have troubled their higher cost competitors. At times they have even welcomed the prospect of competing mines being forced to close. There has been a progressive rise in the scale of mining and processing operations, and an increase in the ratio of fixed to variable costs. Both have meant that profits are maximised when output is sustained at capacity.

Indeed, one of the easiest ways of lowering unit costs, and riding out weak prices, has been to expand output, thereby spreading fixed costs over greater volumes. The increased production helps the expanding companies, but at the expense of a deteriorating market balance. Even the higher cost producers are averse to cutting output or closing down, if any drop in prices is expected to be temporary. They will produce as long as prices exceed their aviodable costs, which are a relatively small proportion of their total costs. Where mines are heavily indebted the lenders may prefer their continued operation with some chances of eventually receiving back their loans. Closures may be intended as temporary but often prove permanent. Some mines are closely integrated with subsequent processing stages that would be disrupted if the mines closed down. Cash losses from the mines are regarded as preferable to much greater losses from disrupted operations. Where a mine is committed to large-scale rehabilitation and environmental programmes on its closure, its management will always strive to remain in production because the costs of closure may exceed those of continuing to produce, even at a cash loss.

The evidence from the copper industry from the 1975 and 1982 recessions shows that production fell strongly in Canada and the United States during both recessions, although by no means in all mines. Elsewhere there was very little difference between changes in the mine output of countries dominated by state ownership and control, and those where private ownership prevailed. In the recession of the early 1970s the consumption of refined copper metal dropped by almost 22 per cent between 1973 and 1975. US mine output dropped by nearly 18 per cent and Canadian by 11 per cent (*Metallgesellschaft (annual)*, Metal Statistics). By contrast, Peru's mine production fell by as much as consumption. Chile, whose mine ownership was far more concentrated than in North America reduced its production by over 8 per cent, and Zambia cut by over 5 per cent. Private sector producers in South Africa and the Philippines kept their output steady.

The North Americans suffered so much partly because they had a large number high cost and under-capitalised mines that could not withstand the fall in prices. Interestingly, the large open pit mines of British Columbia were much less affected than the underground operations of Eastern Canada. In the early 1980s' recession only Canada and the United States reduced their mine output to any significant extent, and in both cases by much more than the 8 per cent drop in total consumption. The main culprit was their deteriorating competitiveness rather than the nature of mine ownership.

Paradoxically, state ownership had the opposite effect on mine supply to that claimed by the proponents of 'social metal'. Once they were taken into public ownership many mines were treated as sources of revenue and employment. Costs, especially of social overheads, tended to rise unchecked, and management became bureaucratic and unwieldy. In some instances nepotism developed, with managerial posts within the gift of government ministers. Mine revenues were passed direct-

ly into the government's coffers, often with insufficient retained to allow for replacing equipment, let alone the modernisation and expansion that are essential for mines to sustain their output. Mining is an industry where it is literally impossible to stand still, with retreat the only alternative to advance. The consequence was an erosion of capacity, initially on a modest scale, but then far more rapidly, with serious adverse consequences for national treasuries. The halving of copper output in Zambia over the past thirty years, and the almost complete collapse of Congolese production over the past decade are extreme examples. Even in Latin America the output of state-owned companies tended to stagnate, notwithstanding rising total demand, and contiuing investment elsewhere.

There is no theoretical reason why state-owned companies should be any less technically capable or efficient than privately owned companies. Some have performed relatively well over the past twenty years, but they are exceptions to the general rule. Privately-owned companies can also be badly managed and starved of cash, but they can only survive for long periods where they are genuinely private and their shares are not traded on stock exchanges. In due course they will be forced to change, be taken over, or close down. That discipline of the market place has not applied in uncompetitive state-owned companies. The relative decline in the latter's output, however, eventually contributed to the liberalisation and privatisation of the past decade. Although not all mining assets have been privatised, or will be so, the remaining state-owned companies are either competitive or are in such a bad way that their output cannot drop much further.

Privatisation has in many instances involved performance targets and investment programmes for the acquiring companies. Moreover, the price of the assets acquired has sometimes been bid up their underlying worth. In effect the incipient rent from the ore deposits has been paid over in advance. Where that has occured the purchasers have had a strong incentive to increase output and lower costs, or to start commercial production as quickly as possible. Little heed has been paid to the present or prospective global balance between supply and demand. The development of many potentially viable ore deposits had been inhibited by their state-ownership. The release of that inventory prompted a surge of investment that might have been otherwise spread over a long period. Once the capacity has been expanded or installed there is a strong incentive for the operators to maintain output as near to capacity as possible, and to raise that capacity.

Paradoxically, therefore, the reversion of mining assets to private ownership has increased the potential supply relative to total demand. Since nearly all the mines that have recently developed from such assets claim that they have low cash costs, they are highly unlikely to reduce their output when demand and prices fall. It is more probable that the net effect of the past decade's privatisations has been to reduce, rather than adavance the flexibility of mine supply.

As in the past, the burden will always be carried by the higher cost producers, especially where mining accounts for only a small share of total national output. In those circumstances the effects of mine closures on the national economy will be muted, no matter how serious their local impact. That means that national economic policies will not be affected by the plight of the mining industry as it might in a country like South Africa, or possibly even Australia. Perhaps the North American mining companies were better served by state-ownership of mining assets overseas than they appreciated; it was more social than they realised. ■