How the mighty are falling
any big, capital-intensive industries are locked in a damaging cycle of over-supply – and the swings may be getting worse, warns Tony Jackson

One of the vexed questions for the world economy is how far corporate earnings will weaken next year. But there is one group of industries whose earnings are already sliding into the abyss. These are the big, capital-intensive commodity manufacturers: steel, paper, petrochemicals and – the latest addition – memory chips.

Each of these industries is locked into a self-destructing cycle of overbuilding: an attempt to dominate the market with ever-larger plants, resulting merely in wider swings in price.

Many executives blame the latest downturn on the Asian crisis. However, to a large extent, the crisis does not have an external cause but is simply the latest and most extreme expression of the cycle itself.

To an extent not always understood, the swings in those industries are divorced from the broader economic cycle. Demand for their output rises at a pretty steady rate, in good times or bad. What swings around wildly is the price – and that is a function not of demand but of supply.

Take a basic chemical such as ethylene. Suppose supply and demand are in balance, and that demand is rising at 3 per cent a year. No new plants are built, so after five years, demand exceeds supply by 16 per cent, and the ethylene price rockets.

This prompts the producers to expand capacity, by perhaps 30 per cent. There is now excess supply, and the price plummets. It takes another four years for supply and demand to get back in balance, and then the process starts again.

Worse, the plants have also got bigger. In the 1980s, an ethylene plant might have had an annual capacity of 100 tonnes. Today's figure is closer to 1,000 tonnes.

The same is true in the paper industry. Sappi, the South African producer, has just built a plant in Austria with a capacity of 470,000 tonnes. European demand for that grade of paper is 3m tonnes, rising at 6 per cent to 7 per cent a year. So that plant alone accounts for more than two years' market growth.

Why do producers in those industries move in lock step, all building new plants at the top of the cycle? One reason is natural optimism: they think it will be different next time round.

Three years ago Union Carbide, the US chemical company, started giving separate results for its commodity businesses for the third quarter of this year. Union Carbide lost $12m in commodities compared with a $125m profit in the previous year's third quarter. The company, of course, blamed the Asian downturn.

A second reason is what economists like to call the hog cycle. Producers of hogs in the US – decide each year how many pigs to breed, based on prices prevailing in the previous period. Their collective decision, in turn, dictates prices in the next period.

An article in the Wall Street Journal last week drew attention to the present calamitous state of the US hog industry, with farm prices at their lowest for 27 years. As it happens, the problem is apparently that farmers are raising ever more enormous herds in an attempt to beat the cycle.

The third reason is perhaps the most insidious. Professor John Kay, of Oxford's Said Business School, drew attention in 'this newspaper recently to the so-called Nash equilibrium. Derived from game theory by the Nobel prize-winner John Nash, this concept states that in which no player in the game can move without provoking countermoves from the others. As Prof Kay says, Nash's theory demonstrates that the higher the ratio of fixed costs to variable in a given industry, the more that industry will suffer from overcapacity. "Such an industry has to decide how much capacity to install, given that the price for your output will depend on the decisions of others," says Prof Kay. "If all your costs are variable, that doesn't arise. You can make decisions in the light of actual knowledge as you go along."

The most common response for players in capital-intensive industries is to go for size, in the hope of squeezing out competitors and reducing dependence on their decisions. Hence the recent spate of mergers, such as last week's $6.8bn purchase of Union Camp by the US's biggest papermaker, International Paper.

The other approach is simple gigantism. This is where Asia comes in. The two biggest steel plants in the world are in South Korea; the next is in Japan. Most of the world's new capacity in petrochemicals in the past decade has been put up in Asia. The same is true of memory chips, with Korean producers such as Samsung and Hyundai leading the chase.

In chips, the tactic was successful for a long while. US producers of commodity chips in particular simply withdrew in the face of the Asian assault.

But if such tactics make sense for an individual player in the short run, they cannot ultimately make collective sense for an industry. In those various industries, Asian producers were for a while the builders of last resort. Now, it seems, the 'volume game has reached stalemate.

What is the way out of this impasse? In some industries, the answer may lie in technology. In steel, the balance of power has already passed from the big old integrated mills to mini-mills – cheaper, smaller plants that make steel from scrap.

In paper, may one day be true in petrochemicals. A new technology called process intensification uses micro-reactors to produce chemicals on a tiny, flexible scale. In the long run, plants costing upwards of $500m may become obsolete.

But what of the commodity chip industry? The cycle in this business is somewhat different. Rather than building incremental plants, chipmakers scrap their plants every few years and build new ones – at a cost of up to $2bn apiece – to exploit the next generation of technology.

This is just about feasible if demand grows fast enough. But it will not do so for ever, any more than plastics could sustain their headlong growth of the 1950s and 1960s. And as growth slows, the payback period will lengthen, to the point where the economic model breaks down.

In the other, older industries the outlook may not be so stark. But in all of them, the strategy is the same: to cut costs and get bigger. The implicit assumption is that sooner or later, the good times will roll again. It would not do to count on it.