

David / Eoin,

My email of the day (1) that you published on 27-April was meant only to sound a warning on too much reliance on reserve estimates for assessing investment worth. Your comments on the day, and subsequent comments since then acknowledge this. But the debate is obviously a hot one, and after reading the Citi report posted on 28th April, I offer the following further comments.

in regard to the Citi report: --

You have already voiced concern on this report, so it probably needs no further discussion, but for the record here is a short reply:

The conclusions that the authors try to draw from their reserve assessments are misleading, particularly from a long term investment perspective. The report itself includes all the information as to why this is the case: For example: the authors correctly point out that “The data do not take into account the economic nature of the reserves” The international reporting standard for reserve reporting (the JORC Standard) concerns itself only with how well delineated the reserves are through drill hole information etc. NOT the economic viability of the reserve. So, as in my silver mine example in the previous e-mail, commodities that have a high cost of reserve delineation have limited reserves (in terms of mine life) and commodities that have low costs of delineation compared to the other costs of production, have more extensive reserves (in terms of mine life). Bauxite and Coal are typically quite shallow, and easy to delineate, and thus often have large reserves. Open pit mines provide ready access to drills and relatively low costs of delineation whereas underground mines are much more confined and consequently suffer high costs. So if we look at the quoted reserve position for copper in Chile (30 years) and consider that Chilean copper comes from large open pit mines, and compare that to Australia’s copper reserve (27 years) – with Australian copper coming principally from underground mines (for example: BHP’s Olympic Dam, Xtrata’s Mt Isa Mine) then you could infer that Australia is probably in a substantially stronger position going forward! Clearly certain regions of the world have resource endowments greater than other regions, but I argue this has almost nothing to do with decisions to invest. For investment you need to know the cash costs (amongst other information) and reserve estimates say nothing about this. The most that reserve estimates might say from an investment perspective is that a company with larger reserves might have greater scope to expand and this option value might merit a higher valuation.

in support of the Fullermoney Position over the last few years

I fully support your “rising demand meets inelastic supply” story. I think you are 100% correct and that this is a reliable economic model/foundation for the commodities market in the short to medium term – hopefully another 3-5 years, or longer, for those of us in the resources industry.

There is no doubt about the rising demand. But the “inelastic supply” side of the argument is not so simple. I’ll illustrate by example:

In the late 1970s, with the second oil crisis there was significant increase in demand for thermal coal throughout the world as power stations switched from oil to coal and new coal fired power stations were built. Coal producers responded by expanding production from existing mines and opening up new mines, almost all drawing on

reserves or resources already well understood (we didn't have to go look for new coal!). The expansion was sufficiently responsive that supply quickly outstripped demand. By 1984 internationally traded coal quantities were growing substantially, but prices had collapsed. This has been the story of mining for most of my career.

In my view, the story of "rising demand meets inelastic supply" in 2010 is not one of limited resources. The explanation this time around (in 2010) has to be about why prices have not collapsed. Let's look at the situation then, and compare it to the situation today:

In the early 1980s it was the Japanese economy that was growing and it was the Japanese buyers who were driving the structure of the industry. Japanese consumers or Japanese trading houses often took small equity stakes in export mines and provided offtake guarantees. With producing companies being generally less capitalized (compared to today) finance for projects was sourced from banks, and bank finance was in part dependent on this participation by the Japanese [or other buyers] as a risk mitigation device. "Japan Inc" had a deliberate policy of promoting over-expansion (moving the supply curve to the right and lowering prices across the board). They deliberately promoted development of less-economical mines (in Canada, for example), using their market power against a fragmented industry on the supply side. The small losses they took on their equity investments were more than compensated for by the lower overall price, and by trading fees (not to mention the inside information they obtained!). Not all suppliers used project finance or had equity from buyers, but a sufficient number of them did to impact the industry structure.

The capital structure of a typical mine plays a large part. Most big mines are highly capital intensive. If a selling price of (say) \$50 /tonne is needed to make the mine viable, then typically \$25 of this is operating cost (cash cost), and \$25 is servicing the capital/profit. And, unlike many other industries, the capital in a mine is sunk (no pun intended ... you can't sell off an unwanted mine shaft). Thus even if prices collapse, the mine won't necessarily go out of production – indeed, faced with lower prices, many mines will expand production because often the marginal cost of expanded production yields higher cash flows. The "recession" is exacerbated. The export coal industry took more than 10 years to work through this over-production capability.

Since the mid 90s the resources industry has changed substantially. With Japan in recession and with the rise in demand from China, the Japanese no longer command the market power they once had. And there has been substantial consolidation on the supply side. With this consolidation has come much more discipline in marketing and well as greater financial capability. It is worth noting that new investment is not predicated on (current) prices, but on the expectation of the price over the life of the investment. In the early 1980s financiers readily accepted coal price projections into the stratosphere [financiers have a way of convincing themselves something is a good deal, so long as everyone else in the industry is doing the same thing] . Now, in 2010, balance sheet financing is the order of the day, and new investment is much more disciplined and constrained. No major industry players believe that the current high prices will be sustained in the long term, and, somewhat paradoxically, their caution in investing is helping to sustain the high prices for longer than they expect. So, I personally will remain fairly bullish until too many players with access to ill-disciplined sources of finance come along and undermine the industry structure.

So, I argue, the "inelastic" supply stems much more from changes to industry structure and the decline of Japanese influence than it does on access to resources.

There is a third force also in play with respect to the Chinese market demand - the capital intensiveness on the demand side. Coal and Iron Ore go to feed power plants and steel mills – both are also very capital intensive. Once built, it is more economical for these plants to pay a higher price for their raw materials rather than reduce demand, *even if they are losing money*, because an under-utilised plant will result in even bigger losses. Any over-investment on the demand side will exacerbate the supply/demand imbalance in the same way that the coal “recession” of the 1980s was exacerbated by the over-investment on the supply side.

So, I believe the “rising demand meets inelastic supply” story will hold for the time it takes for new investment to take place by new entrants in the industry. New mines in less-established parts of the globe will have some influence, but I don’t rate this a big risk – some people think that mining is just a simple process of digging a big hole in the ground, but in practice it is a sophisticated science where inexperience often leads to failure. Then there is political risk in the less-developed world. However, even without Chinese investment in less-economical mines and/or regions of the globe, the high profitability for existing players cannot be sustained. Established industry players must match new entrants (like Fortescue Metals in Iron Ore) with expanded production or risk losing growth opportunities and market share, and the supply/demand equation will eventually be brought into balance. It will not be the access to reserves that determines the longevity of the “inelastic” supply.

Hope this knowledge helps with the empowerment