ZINC: AN INDUSTRY RESPONDS TO THE "ELEGANT REVOLUTION"

A METHODOLOGICAL STUDY IN SUPPLY — DEMAND ANALYSIS

by

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EDITORIAL NOTE: From time to time, studies from security analysts come into view, which are good examples of the art and practice of fundamental analysis. This presentation reflects a well balanced approach to commodity forecasting, in an area that is just as relevant in Australia as it is in Canada. NHC

SUMMARY

During the past ten years, the producers of both capital goods and consumer products have placed an increasing emphasis on elegance. Elegance is bad news for mining companies because it decreases the growth in demand for metals.

Of all the major base metals, zinc is faring best in the "Elegant Revolution". Two of zinc's most important advantages are:

— On the demand side, the zinc industry is working to understand their needs of zinc consumers, to satisfy these needs, and to help consumers implement new applications of zinc. A prime example is the introduction of "ThinWall" diecasting, a "high-tech" process, to the automobile industry.

— On the supply side, 80 per cent of the western world's zinc is mined by companies without government sponsorship. (For comparison, only 40 per cent of copper comes from disciplined producers.) Furthermore, of all zinc consumed, only about 6 per cent can be recycled. (Comparable figures for copper and aluminium are 18 per cent and 21 per cent respectively.)

Zinc supply and demand are delicately in balance. In the absence of surprises, they will stay that way, and zinc prices will remain firm but unexciting. However, the zinc "pipeline" is long and accidents are likely. Such an accident — a spurt in East Bloc demand, or ice and bad weather delaying the delivery of concentrates from Canada's Arctic to Europe, a continuation of the current strike in Australia or another strike in Ireland could upset this balance, and set off a price explosion like that of 1973-74. We cannot anticipate when this explosion might occur.

INTRODUCTION

A major technological revolution began about ten years ago. In the past, our society has passed through a Stone Age, a Bronze Age, an Iron Age and a Steel Age. Future historians may mark the early 1970s as the beginning of a New Materials Age. The trend towards the use of New Materials is part of a larger movement, a movement to "do more, with less". The underlying theme of this larger movement is *elegance*. We term this movement the *Elegant Revolution*.

The major impeti to the Elegant Revolution have come from Japan, from action by western governments, and from the introduction of silicon chip technology.

Because Japan is small and crowded, its manufacturers have gained expertise in minaturization, in energy efficiency and in reducing pollution; in a word, *elegance*. Japan's elegant consumer products have had a major influence on the world's tastes.

From the point of view of the zinc industry, the most significant government actions have been:

a. In the early 1970s, the American Federal Government required that the efficiency of passenger cars, in terms of miles per gallon, be approximately doubled in ten years.
b. Since the late 1960s, western governments, led largely by the Government of California, have erected a complex web of regulations and agencies designed to monitor and raise the levels of public health and safety.

Manufacturers and processors have responded to these challenges in the following ways:

a. *substitution* — of light materials for dense materials, in order to make automobiles lighter (for example: plastics instead of steel)

— of innocuous materials for those thought to be a public health hazard (for example: ceramics instead of asbestos)

b. *redesigning equipment using existing materials* (for example, making automotive components of zinc, as before, but with thinner walls).

c. using *new processes* to reduce the weight of automotive components (for example, the use of microelectronic devices).

d. using new processes and materials to *eliminate* automotive components (for example, the ceramic engine block being developed by Toyota will need no cooling system).

Zinc has been greatly affected by the Elegant Revolution, largely because the automobile industry is the major user of the metal. In this report, we look at how the zinc industry has responded to the challenge of the Revolution, how it will respond in the future, and what it means to the investor in Canadian mining and metals stocks.

HOW ZINC IS PRODUCED AND SOLD

About 80 per cent of the non-Communist world's capacity to mine zinc is in western Europe, North America, South Africa, Japan and Australia; that is, in countries whose production is disciplined to some degree by market forces. By comparison, only 40 per cent of the world's mine capacity of copper is in these countries. Although the zinc market is, as a result, more disciplined than the copper market, there is still a considerable amount of Government intervention, even in the so-called "market economies". We note that governments in both Australia and Western Europe fought to keep mines open during the recent recession, even when they were uneconomic. The most disciplined part of the market is, in fact, Canada's 25 per cent share of capacity.

Zinc is produced from:

a. Copper-zinc-gold-silver ore-bodies (e.g. Noranda's Geco deposit, Ontario).

b. Copper-zinc-lead-gold-silver ore-bodies (e.g. Westmin's Vancouver Is. mines, B.C.)

c. Zinc-lead ore-bodies (e.g. Pine Point's mines, N.W.T.)

d. Zinc-lead-silver ore-bodies (e.g. Vestgron's Black Angel mine. The mineralized zone being explored by Regional Resources and Canamax Resources, at their Midway property, northern B.C., is also of this type.)

Clearly, geology forces producers of zinc to be producers of other metals as well.

The ore in a zinc mine typically contains several per cent metal. The ore is treated in a mill, where concentrates are produced. Zinc concentrates typically contain about 50 per cent metal, in the form of sulphur compounds. Concentrates are shipped to a smelter, where the metals are extracted and the sulphur removed.

If silver and gold are present, they usually wind up in the concentrates. Although a smelter will give credit for about 95 per cent of the gold and silver in lead concentrate, there are usually no credits for gold in zinc concentrate, and only small credits for silver, in fact, over half the world's primary production of silver is extracted from lead concentrates, often as a by-product of zinc production.

There are three reference prices for zinc: the "Overseas" producer price (often still called the "European producer price"), which governs most sales of concentrates by mines to smelters, and most sales of zinc metal outside the USA; the US producer price; and the spot (London Metal Exchange) price. The overseas and spot prices are based on the assumption that the metal is 98 per cent pure. However, most of the world's zinc is sold as 99.93 per cent or 99.99 per cent purity and is therefore, at a premium to the quoted price.

We'd like to re-emphasize two of the points raised in this section. Firstly, the primary producers of zinc are, to a degree unusual among metals, disciplined by market forces. Secondly, it is difficult to isolate the production costs of zinc because the metal is almost always produced with by-products or co-products.

The Outlook for Demand

(i) Overview

Zinc's most important properties for commercial applications, and for potential commercial applications, are:

a. a thin zinc coating protects iron and steel from corrosion;

b. zinc is easily cast into shapes;

c. zinc mixes with copper to produce corrosion-resistant, easily worked, attractive alloys (brass and some bronzes);

d. zinc mixes with aluminium to produce corrosion-resistant, easily-cast alloys with a high bearing strength (the market for this form of zinc has not yet been developed);

e. zinc "dust" and zinc oxide can be used in making paints, chemicals and rubber products;

f. zinc can be easily shaped by rolling.

Table 1 indicates the most important uses of zinc in 1981.

As we show below, the use of zinc is declining in some areas. However, the zinc industry is blessed with an aggressive producers' association, the Zinc Institute, which promotes new uses of zinc and works closely

Table 1

Use	*Proportions of all zinc consumed by this use, in industrialized countries (1)*	*Major properties of zinc exploited by this use*
Coating iron and steel	45%	Protection from corrosion.
Die-casting	20%	Does not easily corrode; easily cast.
Manufacture of brass	18%	Mixes with copper to produce corrosion — resistant, easily worked alloys.
Zinc oxide and zinc powder	8%	Used in making paints, chemicals and rubber products.
Rolled zinc	5%	Does not easily corrode; easily cast.
Miscellaneous	4%	Miscellaneous
Manufacture of zinc-aluminium alloys	0%	Mixes with aluminium to produce corrosion-resistant, easily cast alloys with high bearing strength and resistance to wear.

(1): Source: P. Irwin, Canada Metal, 1982.

with groups involved in producing or revising specification codes. Furthermore, the International Lead Zinc Research Organisation sponsors research into new uses for zinc.

(ii) Coating Iron and Steel

There are two major products: galvanized steel (steel coated with zinc) and Galvalume (steel coated with an alloy which contains 43.5 per cent zinc). Although Galvalume is technically superior to galvanized steel in 15 per cent of end uses, its use has been inhibited by a high royalty payment (which expires this year) and by high capital costs. For example, Dofasco spent $7 million converting a galvanized sheet line to Galvalume. $0.9 million of this cost was for the licence. To capture part of the market which is being developed by Galvalume, the International Lead Zinc Research Organisation has developed Galfan; steel coated with an alloy which is 95 per cent zinc.

The automobile, consumer durable goods and construction industries are the major users of coated steel. Although Galvalume will probably replace most galvanized steel used in roofing, Galvalume seems to be unsuitable for the automobile industry because no-one has figured out how to paint it.

It already takes 8.4 pounds of zinc to coat the average US car — up 2 per cent from a year ago. With governments and the automobile industry concerned by automobile perforation warranties and law-suits, the amount of zinc in coatings could increase to as much as 15 pounds per car. An example: the 1984 Dodge Caravan and Ram vans have almost complete zinc protection on outside panels and underbody parts.

Galvanized steel has been replacing wooden studs and frames in the construction industry. In the US the demand for zinc in this application has been growing at double-digit rates. We expect this trend to continue during, at least, the remainder of this decade.

(iii) Die-casting

Die-casting is one of many methods of casting metals. It involves injecting molten metal, at high pressure and at high rates of flow, into water-cooled steel dies. One die can produce a casting every few seconds.

About 25 to 30 per cent of die-cast zinc is used by the automobile industry for making shapes such as trim. Much of the rest of the production is used by durable goods industries.

In the 1970s automobile manufacturers reduced the weight of their cars by substituting plastic components for die-cast zinc components. The zinc industry responded in several ways. One was to develop a new technology: ThinWall die-castings which use less zinc. As a result, the automotive industry is casting more components from zinc, but using less zinc per component. The amount of die-cast zinc used per automobile appears to have stabilized.

Another response to the "plastic challenge", led by the International Lead Zinc Research Organization, has been the development of greater control and understanding of the die-casting process. Modern die-casting is a high-technology process which, under computer control, can produce stronger, better quality and more uniform components than ever before. The most important step, for the zinc industry was not the development of the technology, but its implementation. Competing members of the zinc industry co-operated on a program of educating production engineers, thereby ensuring that most of the die-casters on the shop floor are happy with the new technology.

One of the most valuable results of the development and implementation of the new technology has been to increase users' confidence. Designers will now specify zinc die-casting for applications they would not have dreamed of a few years ago. A major triumph has been Ford Motor Co.'s recent announcement that it will replace the plastic grille on the 1985 Mercury Cougar with a 4.75 pound cast zinc grille.

(iv) Manufacture of Brass

The average composition of brass is 70 per cent copper and 30 per cent zinc. About a third of the brass produced is in the form of strips and sheets. A major market is automobile radiators.

The brass strip and sheet market is where zinc consumption is most strongly affected by the New Materials Revolution. Plastics and aluminium are replacing brass strip and sheet in many applications. In fact, Toyota's ceramic engine block could eliminate radiators.

(v) Zinc Oxide and Zinc Powder

Zinc oxide is used in making paints, chemicals and rubber products. Tires are an important market. In recent years, tire manufacturers have successfully "done more with less" — tires are smaller and last longer, thereby reducing the rubber industry's consumption of zinc oxide. However, the changes in tire technology appear to have run their course.

(vi) Rolled Zinc

Most rolled zinc is used in making dry cell batteries. With the increasing popularity of small electronic devices, this seems to be a growth area. Another growth area is in coinage: other countries may follow the lead of the United States, which in 1982 began producing pennies from rolled zinc plated with copper. America's zinc pennies alone account for about 1 per cent of the non-Communist world's total annual consumption of zinc in 1982.

(vii) Manufacture of Zinc-Aluminium Alloys

In some areas, zinc is suffering from the Elegant Revolution. Else-where, zinc is part of the Revolution. For instance, the International Lead Zinc Research Organisation began developing zinc-aluminium alloys (63 per cent to 92 per cent zinc) in the late 1960's. The zinc industry is now aggressively promoting the substitution of zinc-aluminium alloy castings for cast iron and brass, and the substitution of zinc-aluminium alloys for bronze as a bearing material. One example: General Motors is beginning to produce hinge assemblies from a zinc-aluminium alloy.

(viii) Exports to the East Bloc

Since 1981, net exports of concentrates to the East Bloc have been steady, at about 0.11 million tonnes of payable zinc metal per annum. Net exports of refined metal, however, have risen sharply from nearly zero in the late 1970s to around 0.23 million tonnes in 1983. The latter figure includes exports to China of at least 0.20 million tonnes. If East Bloc demand continues to grow, instead of levelling off, it could lead to shortages of metal and concentrate, and run-away prices.

(ix) to 1990

The US Bureau of Mines has published the most optimistic forecasts for the rate of growth in the demand for zinc. Their figures imply that demand will grow from the trough year, 1982, at average rate of 5.0 per cent p.a. to the year 1990. The most pessimistic observers look for growth rates of 2.4 per cent p.a. over the same period. In his report, we adopt the latter figure in the interests of conservatism. We note that the trough-to-peak growth rate will undoubtedly be significantly higher.

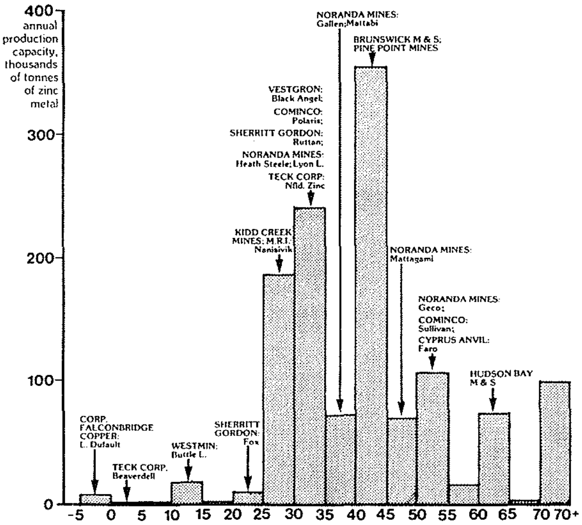
The Outlook for Supply

(i) Primary Supply

Figure 1 shows the approximate range of potential production costs, at the end of 1983, for about 92 per cent of North America's zinc mines, representing 29 per cent of the non-Communist world's capacity. Average costs after credits for by-products and co-products, are 50.0 cents (US) per pound in the USA and 38 cents in Canada. We believe that the effective distribution of costs in the rest of the world is similar but, on average, about 10 per cent lower. We also believe that mining companies will bring new capacity on stream only if they believe that operating costs will be less than those of half to two thirds of existing capacity. Currently, this critical operating cost level is around 40-45 cents per pound. As new, low-cost producers come on stream, they will displace some of the existing high-cost producers. For example, beginning in 1988, Cominco expects to produce 120 thousand tonnes per year of payable zinc from its Red Dog deposit in Alaska. In the early 1990s, this capacity will be doubled. If Red Dog were operating today, production costs net of by-product credits would probably be under 25 cents. In 1988, the appearance on the market of concentrates from Red Dog will probably coax some of the expensive zinc producers into "temporary" closures — closures which could become permanent.

Figure 1

Production Cost*, U.S. Cents per Pound of Payable Zinc Metal



*** - actual or potential mine, mill, transportation and smelter costs, net of by-product credits, December 1983 price levels, but assuming ore mined is at average reserve grades.**

Potential production costs at zinc mines in Canada, the US and Greenland. Only mines in Canada and Greenland are individually identified. (For example: the bar representing mines with production costs of 35 to 40 cents represents some US producers as well as Gallen and Mattabi). Canadian costs were collated by Richardson Greenshields; US costs are from the US Bureau of Mines' Information Circular 8962.

A "rotation" of this type, with old, expensive zinc mines closing down as new, low-cost operations come on stream has been going on for years. The old, expensive plants tend to shut down when large, new capital expenditures become inevitable, and management finds that it cannot justify the investment. For example, Dome Petroleum shut down its Cyprus Anvil operations in the Yukon in 1982 because the company could not afford a $50 million program of overburden stripping. (A year later, the Company in fact began a stripping program, but only because of government assistance).

There are many unexploited copper and iron ore deposits which could be mined cheaply. There are far fewer zinc deposits in this category. Over the long run, market forces will control capacity utilization by ensuring that production and consumption stay approximately in balance. Over the shorter term, however, imbalances will arise because new producers try to run at full capacity in order to achieve a fast pay-back, and the high-cost producers hang on, deferring capital expenditures and waiting for a miracle.

A compilation of projects under construction suggests the trend below in the world's mine zinc capacity. The figures suggest a rate of growth, from 1982 to 1988, of 2.0 per cent p.a., which may be compared with 1.6 per cent p.a. in the late 1970s and early 1980s.

(ii) Secondary Supply

By the time it reaches the consumer, zinc has usually lost its identity. Most recovered zinc is from die-castings, mostly from scrapped automobiles; some is precipitated from the fumes generated when steel mill scrap is melted. As a result, scrap zinc accounts for only about 8 per cent of total supply. As uses other than die-casting become increasingly important, we expect a decline in the recycling of zinc. However, in this report we take a conservative point of view (from the perspective of a primary producer), and project that 8 per cent of the zinc produced per annum will continue to be recycled.

Table 2

Average annual capacity of the non-Communist world's zinc mines, 1982-1988 (millions of tonnes of payable zinc)

1982A(1)	1983(1)	1984P(2)	1985P(2)	1986P(2)	1987P(2)	1988P(2)
5.08	5.15	5.42	5.50	5.58	5.67	5.74
Major new projects:						
Cominco's Polaris N.W.T.	E-Z Ind.'s Elura, Australia	Westmin's H-W, Centromin, Peru	Rampura-Agucha, India	Samim, Sardinia		Cominco's Red Dog, Alaska
	Rajpura-Dariba, India					
	Santa Barbara Mexico					

A: actual, E: estimated, P: projected
(1) Source: Metals and Minerals Research Services Ltd., (2) Richardson Greenshields' projections.

(iii) Smelting Capacity

Zinc ore is mined and milled to produce concentrates. Concentrates are smelted to produce zinc metal. We have devoted most of our attention to the production of concentrates, because we believe that to be the most likely area of any possible bottlenecks. Although the non-Communist world's zinc smelters are currently running at about 90 per cent of capacity, there are new additions to capacity on the horizon. For example, in Thailand, which is building a 60,000 tonne/year plant (1.4 per cent of the non-Communist world's total present consumption); in Canada, where Brunswick Mining and Smelting has plans for a 100,000 tonne/year smelter on the shelf; and in Brazil where plans are, admittedly, vague. In short, we have no fears that a long-term shortage of smelter capacity will develop in the foreseeable future. (We do not deny the possibility that brief shortages of metal may occur due to the lead-time needed by smelters to start up again in response to increased demand).

Table 3

A POTENTIAL INDUSTRY OPERATING ENVIRONMENT IN THE NON-COMMUNIST WORLD

What if: we have a constant level of capacity utilization with 2.4 per cent p.a. growth in demand?

— volumes, in millions of tonnes of refined zinc or its equivalent in concentrates (1) —

	1982A	1983E	1984P	1985P	1986P	1987P	1988P
Mine capacity— year average	5.08	5.15	5.42	5.50	5.58	5.67	5.74
Capacity utilization	94%	87%	85%	85%	85%	85%	85%
Mine production of zinc in concentrates	4.78	4.47	4.61	4.68	4.74	4.82	4.88
plus: recycled zinc (2)	0.31	0.34	0.36	0.37	0.38	0.39	0.40
equals: total mine and scrap production	5.09	4.81	4.97	5.05	5.12	5.21	5.28
consumption of refined metal	4.25	4.52	4.62	4.74	4.85	4.97	5.09
plus: consumption of concentrate by end-users	0.07	0.07	0.08	0.08	0.08	0.08	0.08
plus: net of exports to the East Bloc and Government Stockpile sales	0.16	0.18	0.20	0.21	0.21	0.22	0.22
equals: total consumption	4.48	4.77	4.90	5.03	5.14	5.27	5.39
inventories, start of year (3)	1.80(3)	2.41	2.45	2.52	2.54	2.52	2.46
implied increase (decrease) in inventories during the year (4)	0.61	0.04	0.07	0.02	(0.02)	(0.06)	(0.11)
inventories end of year	2.41	2.45	2.52	2.54	2.52	2.46	2.35
year-end inventories (months of consumption)	6.5	6.2	6.2	6.1	5.9	5.6	5.2

A: actual (sources: International Lead Zinc Study Group (March 1984) and Metals and Minerals Research Services)
E,P.: estimates and projections by Richardson Greenshields.

(1): payable zinc in concentrates = contained zinc divided by 1.07.
(2): from 1983 on, 8 per cent of the previous year's total consumption.
(3): inventories of refined metal and metal in concentrate.
(4): total mine and scrap production minus total consumption.

THE OUTLOOK FOR THE BALANCE OF SUPPLY AND DEMAND
(i) The next few years

In January 1984, the non-Communist world's zinc mines were operating at about 85 per cent of their estimated capacity. We deduce from Figure 1 that the break-even zinc price in North America, corresponding with this level of capacity utilization, is about 55 cents. This is gratifyingly close to the current price.

Table 3 illustrates one possible operating environment for the zinc mining industry in the following 5 years. In this analysis, capacity utilization stays at 85 per cent while demand grows at 2.4 per cent p.a.

The analysis shows that, with constant capacity utilization (note that the capacity utilization was 85 per cent at the end of 1983, although the average rate during 1983 was 87 per cent) and 2.4 per cent growth in demand, inventories would decline from 6.2 months of consumption to 5.2 months. Although 5 months of inventories sounds like a high number, note that we include inventories of zinc in the form of concentrates as well as inventories of zinc metal. Moreover, the "pipeline" in the zinc industry is a long one. For example, a tonne of zinc concentrate may be produced at Cominco's Polaris mine in October and not smelted until several months after it arrives in Europe the following June.

At 6.2 months' consumption, current inventories are tight. What would happen if they were to run up to the 8 month level by 1988? (We estimate that inventories were 8 months' consumption at the start of 1978, which was, incidentally, a good year for zinc prices). Furthermore, what would happen if demand were to continue to grow at 4.5 per cent for the next few years? (For comparison, note that demand grew by 6.4 per cent from 1982 to 1983). To respond to these "What if" questions, we have used a series of analyses similar to that of Table 4.

We conclude that, if demand slows down and inventories remain low, zinc prices will do only marginally better than inflation. However, note that the zinc pipeline is long, reducing the flexibility of the industry's response. Since the balance of supply and demand is delicate, a price explosion, like that which occurred in 1973-1974, is a real possibility. This delicate situation is reflected on the London Metal Exchange, where spot prices have exceeded the three-month futures prices since January of 1984; and where zinc inventories have declined by over 40 per cent since their high in September 1984. Some of the "accidents" which could set off a price explosion are as follows:

- an increase in exports to Communist countries;
- a strike by a major producer, such as the Tara Mines strike in 1981;
- a delay in shipments of Arctic zinc concentrates, due to bad ice conditions.

In attempting to analyse the effect of an "accident", we are forced to admit a shortcoming of the above analysis. By considering inventories of zinc both as metal and in concentrates, we make it more difficult to identify where bottle-necks might occur in the pipeline. Concentrate markets are different from metal markets. Although each must ultimately reflect the other, it is possible for concentrates to be in plentiful supply while shortages exist in the other form. As indicated earlier, we do not anticipate any prolonged shortfalls in smelting and refining capacity. However, with inventories of the metal producers currently averaging about 24 days of demand, surges in demand can lead to shortages of metal and price flurries which are not reflected in the revenues of concentrate producers.

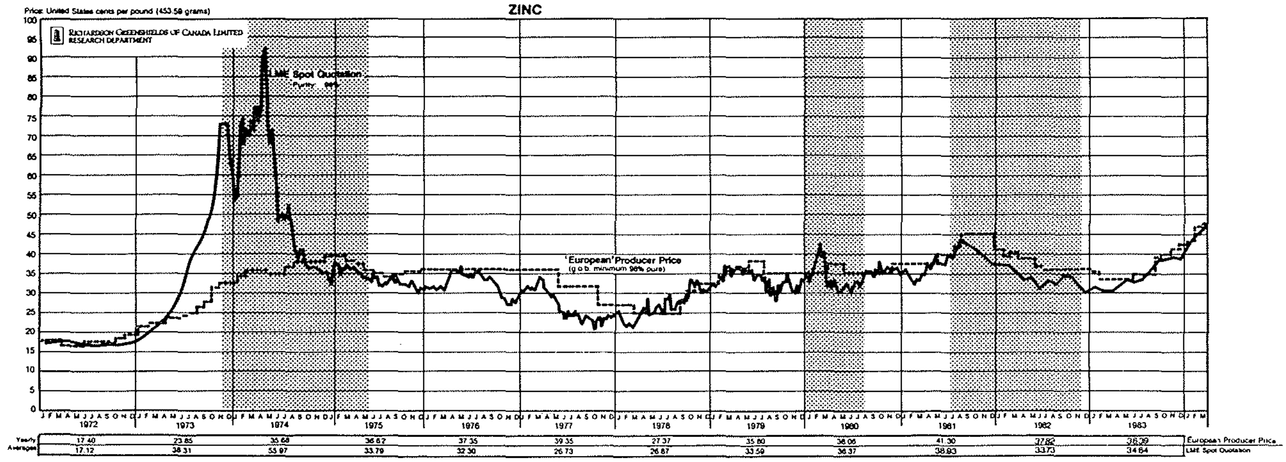
Table 4

ALTERNATIVE OPERATING ENVIRONMENTS OVER THE NEXT FIVE YEARS IN THE NON-COMMUNIST WORLD'S ZINC INDUSTRY

What if?:	— Demand grows at 2.4% p.a.	— Demand grows at 4.5% p.a.
What if?: — Inventories stay at 6.2 months' consumption	By 1988, capacity utilization rises to 88%. As a result, zinc prices barely keep pace with inflation.	Runaway prices by 1988
— Inventories rise to 8 months' consumption by 1988.	By 1988, capacity utilization rises to 89%. As a result, zinc prices outpace inflation by about 3% per annum.	Runaway prices by 1987

NOTES: The price projections shown on this table are derived from Figure 1. The price increases shown are those required to reach the break-even cost of any particular level of capacitiy utilization. Runaway prices are forecast when capacity utilization exceeds 96 per cent.

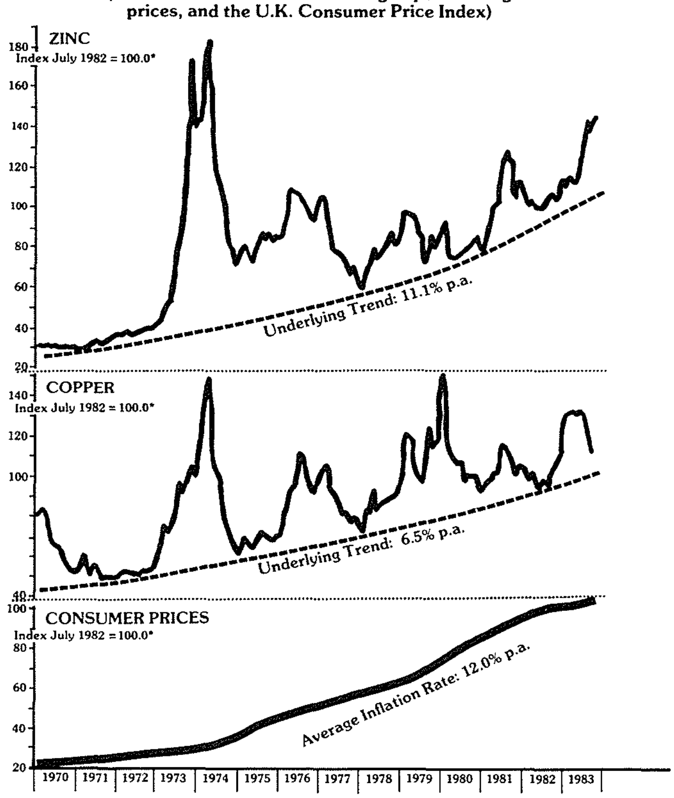
Figure 2



The situation in the zinc market, as outlined above, is not new. For over a decade, the zinc market has been characterised by a fine balance between supply and demand, and a long pipeline. Figure 2 shows recent trends in zinc prices, and in Figure 3, these trends are compared with copper prices and overall consumer prices. Note that the underlying trend in zinc prices has been in line with consumer prices, with strong excursions above the trend-line reflecting of shortfalls in supply or spurts in demand (Figure 2). The 1973-1974 spike, for example, was largely the result of a heavy build-up in inventories.

Figure 3

Relative Trends in Copper, Zinc and Consumer Prices (based on London Metal Exchange Spot Sterling prices, and the U.K. Consumer Price Index)



*-For metal prices, July 1982 was the trough of the last recession

Compare the pattern of zinc and copper prices shown in Figure 3. Because market forces have exerted less discipline on copper producers than on producers of zinc, and because of continuing market development by the zinc industry, the underlying trend in copper prices has been much weaker.

Figure 4 shows inventories of base metals reported by the London Metal Exchange. The improvement in zinc has been proportionately greater than that for any other metal.

Figure 5 shows that zinc prices are traditonally weak in the spring and early summer and strong in late summer and early fall.

Figure 4

Inventories, London Metal Exchange

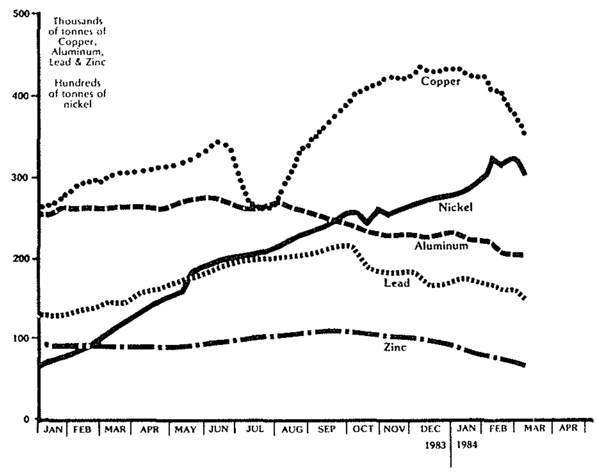
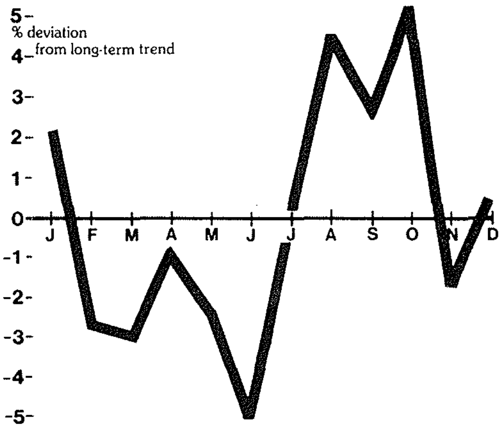


Figure 5

Estimated Seasonal Variations in Zinc Prices, 1984 (based on: London Metal Exchange 3-month prices, in pounds sterling, 1960-1983)



(ii) In 1984 and 1985

By analogy with previous episodes of runaway prices (such as molybdenum and silver markets in 1979-1980, lead markets in 1979 or zinc markets in 1974), an "accident" in the zinc market would last about a year, would take zinc prices towards $1.00 per pound, and would finish with zinc prices *below* today's level.

In the absence of such an accident, we expect that the price of 99.99 per cent pure zinc will average about $US 0.55 per pound in 1984 and $0.60 per pound in 1985.

We recommend the following investment strategy. Investors should purchase shares in companies which offer exposure to zinc in the event of runaway prices, but which offer sound value if zinc prices do not run away. Furthermore, investors must be prepared to be opportunistic, and sell out at the very time that zinc prices appear headed for the moon.

THE FINANCIAL ANALYSTS FEDERATION: ANNUAL CONFERENCE

April 29 — May 2, 1984.

Report by

T.C. Powell

The Financial Analysts Federation is the professional organisation for security analysts and investment managers in the United States and Canada. With 52 regional societies, the Federation has a total membership of over 15,000 and sponsors more than one thousand meetings a year at which corporate representatives discuss developments in their companies and industries. The purposes of the Federation are to: "(1) improve the quantity and quality of information available to investors; (2) increase the professional competence of analysts and investment managers; (3) raise the ethical standards of the membership; and (4) strengthen the environment for investment practitioners and investors generally." In addition the Federation conducts three formal study programmes annually, publishes its own journal and maintains boards of review covering ethical standards, financial accounting, government relations etc.

The federation recently held its annual conference over four days in Los Angeles with the theme, Global Competition — The Investment Challenge. Specific topics were: The U.S. in the Global Economy: the next ten years vs the last; Financial Services: An Industry in Transition; Worldwide Challenges and Opportunities in High Technology; and Stock Market Outlook. The 850 delegates attending were treated to workshops on twenty different subjects, four High Tech company presentations followed by field trips and numerous on site company exhibits.

As to be expected, the standard of speakers was very high. Of the 80 plus speakers the more interesting included John Templeton, founder of Templeton Growth Fund, Professor Mancur Olson, author of The Rise and Decline of Nations, Janos Fekete, head of the Hungarian Central Bank and John Harvey-Jones, Chairman of ICI.

To an Australian observer the Conference was an extremely interesting and worthwhile experience.