

# Lead and the London Metal Exchange — a happy marriage? The outlook for prices and pricing issues confronting the lead industry

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## Abstract

The outlook for the supply–demand balance for refined lead is addressed and takes into account the growing non-fundamental forces on price determination. The market for refined lead is presently experiencing its first year of surplus since the major crisis of the early 1990s. Earlier in the decade, the dissolution of the Soviet Union and recession in developed economies led to a significant rise in London Metal Exchange (LME) stocks. An acceleration absorbed these stocks in an 18-month period in the mid-1990s, and LME lead prices reacted to the market deficit by peaking above US\$900. Since then the market has balanced, yet prices have declined steadily to less than 50% of their peak levels. It is argued that, on fundamental grounds, prices have fallen below justified levels. As much of the reason for this depression between 1997 and 1999 has been the generally depressive effect of the Asian economic crisis on financial markets, the level of lead prices may now be due for a correction. Other metals have begun to increase during the first half of 1999 and lead, given its neutral fundamental outlook, is now poised to participate in the generally more buoyant moods across LME metals. An increase of approximately 10% in average LME 3-month settlement prices is forecast and will result in annual average prices of US\$ 570/tonne over the course of 1999. Monthly averages and spot prices are predicted to exceed this level, particularly during peak third-quarter demand. © 2000 Elsevier Science S.A. All rights reserved.

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## 1. Introduction

Typically, a market outlook is approached via the well-worn path of supply, demand then balance, and prices. This paper is not so radical as to abandon any of these tools, but it is becoming clear, especially for the lead industry, that market fundamentals and prices are becoming increasingly dislocated. This is a criticism that could be levelled at most commodities during various periods. In fact, as the end of the 1990s is approached, the separation of market fundamentals from prices is a criticism that could be levelled at a wide variety of markets, from US stocks, to almost all commodities and, as many would argue, currency values in Asia.

What this paper aims to address, however, in addition to an outlook for the supply and demand balance for lead in the short-term, are some of the non-fundamental pressures on lead prices. Combining these two, a forecast is given for lead prices in Year 2000.

## 2. A fundamental view

The break-up in end-uses for lead metal over the past 20 years is presented in Fig. 1. As is clearly evident, batteries are the most significant growth market for lead consumption. Batteries now account for over 70% of lead consumption, having grown from just under 50% at the beginning of the 1980s. Many of the other uses for lead, such as fuel additives and numerous chemical uses, have either fallen away due to environmental pressures, or been substituted with other materials. Such substitution in certain end-uses has resulted in lead consumption under-performing general economic growth in developed economies. The substitution is now largely complete and further growth in batteries is expected to take this dominant end-use to three-quarters of total lead consumption within 5 years.

Batteries do not just consume lead, they also produce it. Lead produced from secondary sources (principally from recycled batteries) overtook primary lead in 1989 as the dominant source for the supply of refined lead (Fig. 2). Again, this is a trend that will continue, due to higher levels of enforced recycling in less-developed countries

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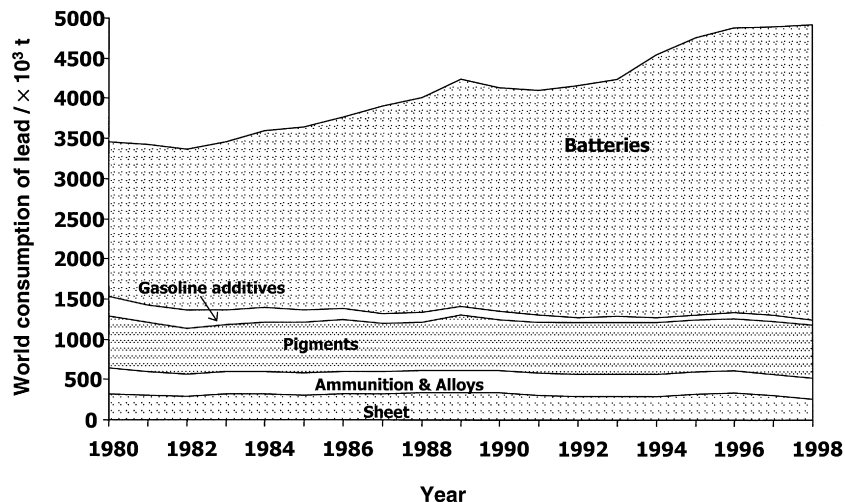


Fig. 1. World lead consumption by end-use.

and, apart from a surge in the next few years, due to a longer-term decline in investment in primary smelting.

The data given in Figs. 1 and 2 clearly show that the lead industry is the battery industry. Whilst it does appear trivial to highlight this, it is important to emphasize that the fortunes of lead are irretrievably linked with the fortunes of lead–acid batteries.

**3. Price and market history: 1990–1999**

Before examining a price outlook for the next twelve months, it is appropriate to review where the market and prices have been over the past decade (Fig. 3).

*3.1. 1991–1994*

At the beginning of the 1990s, the lead industry faced a period of significant crisis (Fig. 3). The dissolution of the Soviet Union at the turn of the decade coincided with a significant recession in most developed economies. Lead flowed out of Russia into the Helsingborg LME warehouse in Sweden as military consumption collapsed and strategic

stockpiles were dumped. LME stocks grew to record levels, peaking at over 350,000 tonnes.

Lead was far from alone during these years, and most base metals suffered similar periods of crisis. The lead stocks had a peak, and after topping out in early 1994, stocks fell at an alarming rate.

*3.2. 1994–1996*

The correction in the lead market was both dramatic and complete. In the space of approximately 18 months, LME lead stocks fell to below 100,000 tonnes. Underlying this turn in fortunes was acceleration in demand in Asia, particularly South East Asia and Korea, as well as the fact that several primary lead smelters finally succumbed to financial and environmental pressures. Between 1992 and 1995, seven primary lead smelters closed.

The industry, now turned on its head, faced an altogether different crisis. This time, and unlike other metals, lead stocks were approaching perilously low levels. At the rate of drawdown indicated in Fig. 3, LME stocks were due to run out some time in early 1996. Price reacted accordingly, with cash prices peaking above US\$900/tonne — a disastrous scenario for consumers. It was set to be, from a dispassionate viewpoint, a test of price reaction to the evaporation of lead stocks.

*3.3. 1996–Present*

The test of the limits of market fundamentals did not, however, eventuate. On the other side of the peak in stocks was a plateau, with stocks levelling out rapidly. In fact, lead stocks have remained stuck between 90,000 and 130,000 tonnes for nearly four years, an astounding record of stability.

The normal reaction of prices to such a physical market is classically thought to be a modest downward correction

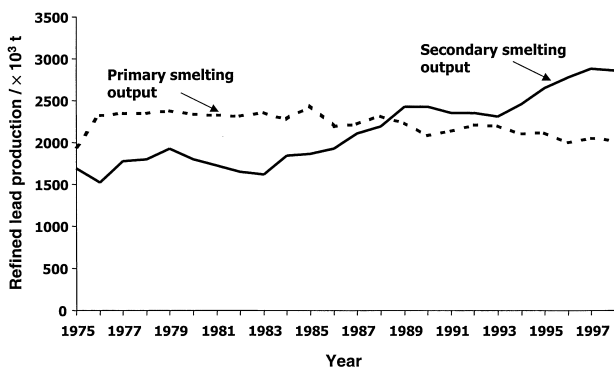


Fig. 2. World lead production by raw material source.

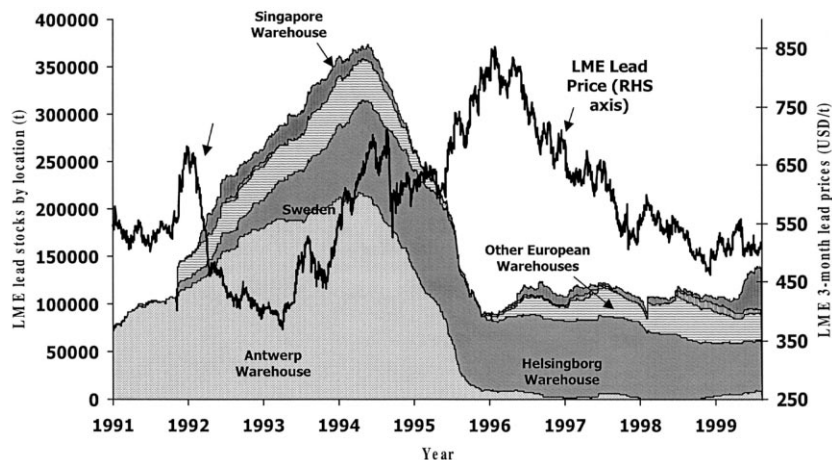


Fig. 3. LME lead price and LME lead stocks (by warehouse location).

followed by stability. This did not eventuate. The price per tonne fell consistently, through US\$650 in 1997, through US\$550 in 1998, and almost down through US\$450 at the start of 1999. Prices have more recently found support under US\$500 and are now trading around US\$530, so it is reasonably safe to say that this 4-year trend is now complete.

The above correction is unexpected and surprising. Granted a correction was due after the market was headed for an almost definite squeeze in mid-1996, few if any industry observers would have expected that the physical market would balance and this would result in a 4-year downward trend in prices.

**4. Current market balances**

Examining recent market events (Fig. 4), it is clear that the second quarter of 1999 has been one of the most remarkable quarters in the physical lead market for perhaps four years. At the end of the LME stock plateau is an

acceleration of stock dumping into the Singapore LME warehouse. It represents the first major placement of lead metal into LME warehouses since the start of the 1990s. The metal is Chinese in origin and is placed on LME warrant in Singapore. Singapore LME stocks were negligible at the start of 1999 (around 5000 tonnes) but have since grown by more than 40,000 tonnes. Is this the start of yet another sustained dumping of lead metal? Chinese exports deserve some detailed consideration.

Although the mechanics of the Chinese lead industry are clouded at best, and are in fact in a state of flux due to restructuring, the industry has developed a recognized pattern of behaviour. One of the major facets of this behaviour is that Chinese exports have reacted to high LME prices (Fig. 5). During much of the mid-1990s, Chinese exports accelerated to above average export levels when LME prices peaked above US\$600/tonne. This relationship, however, dissolved in early 1999, with Chinese exports continuing unabated despite LME prices close to US\$500/tonne.

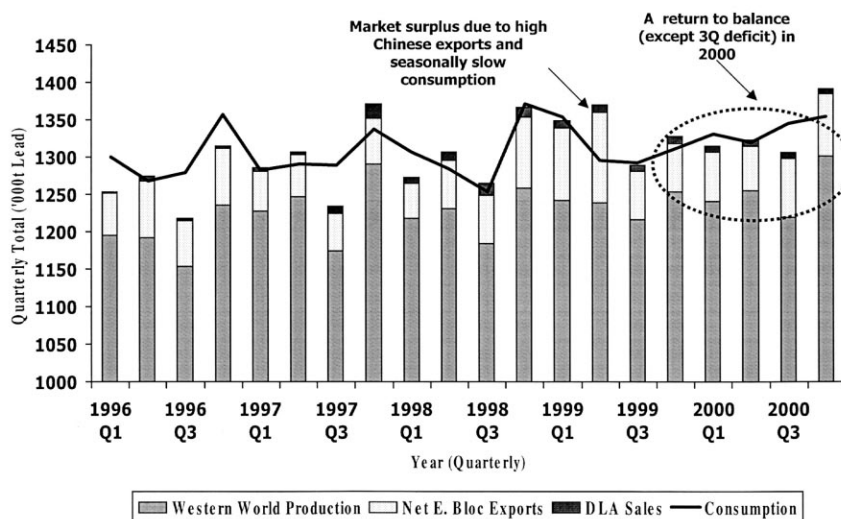


Fig. 4. Quarterly lead metal consumption and production.

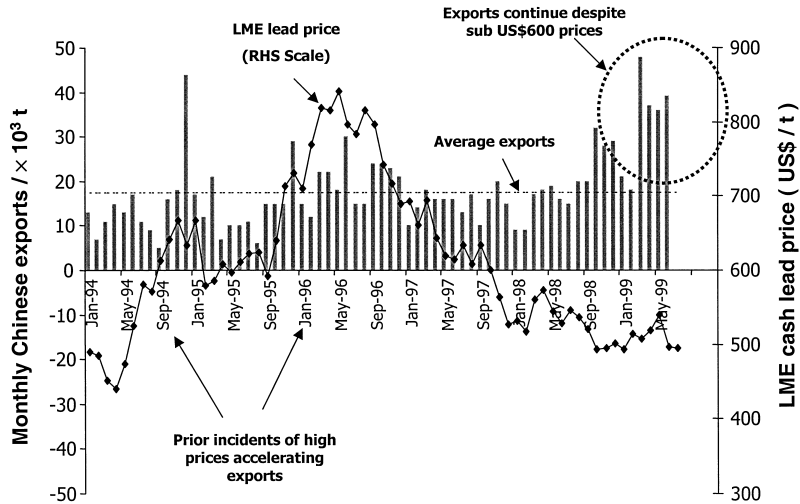


Fig. 5. Relationship between Chinese lead exports and LME prices.

The reason why exports have become price inelastic is a growing appetite for imported lead concentrates (Fig. 6). Imports of lead concentrates accelerated late last year, as tolling of lead concentrates for export emerged as a solution for financially strained enterprises that could no longer rely on variable supplies from domestic mines. In 1999, however, the imports have slowed and this indicates that the surge in refined lead exports this year should come to an end. This is supported by the more recent slowing of Chinese lead exports to the Singapore LME warehouse.

## 5. Forecast market balances

CRU has for some time forecast that 1999 will be a year of surplus for the lead market. Whilst early peaks in demand during the winter period in the Northern Hemisphere questioned the level of surplus, the events of the last quarter have clearly confirmed that, barring an extraordinary autumn season in the USA, 1999 will be a year of surplus (Fig. 7).

The US market is particularly significant with regards to 1999. Whilst Europe and Asia have been languishing as markets for refined lead, the USA has been an exceptionally tight market over the past summer months and has absorbed much of the surplus from other regions. Consumption has accelerated beyond its typical trend, however, and much of the tightness has been caused by supply disruptions, which will eventually pass.

On balance, given that Chinese exports have slowed and European demand should recover during autumn battery manufacture, a surplus of around 80,000 tonnes is now looking likely. This surplus is reasonable given that 50,000 to 60,000 tonnes of additional metal can now be readily identified in various stock locations.

## 6. Outlook for 2000

The dominant feature in the lead market in 2000 is the surge in mine supply now coming on stream. The ramp up in mine output (Fig. 8) makes it appear that the dull and

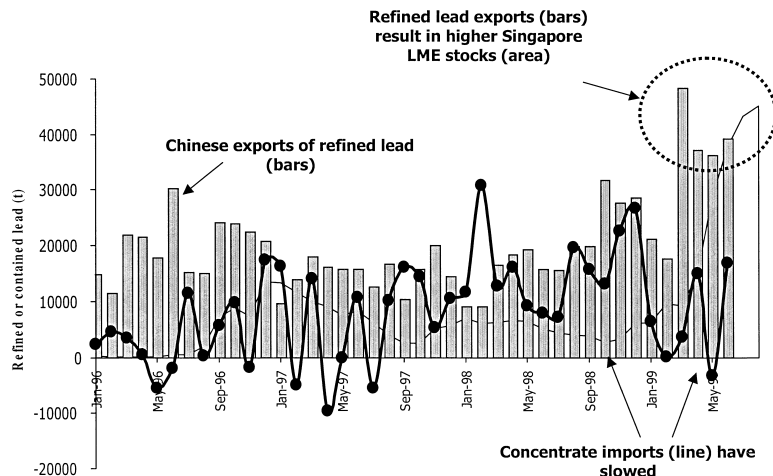


Fig. 6. Chinese concentrate imports, metal exports and LME lead stocks.

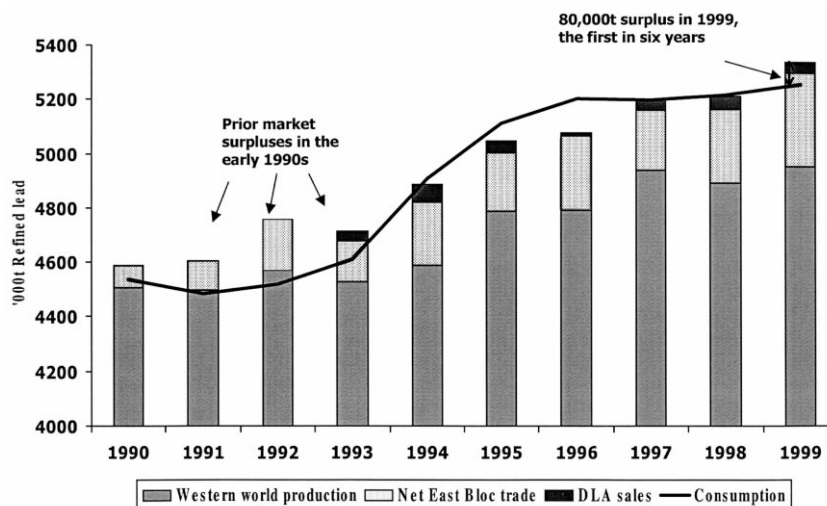


Fig. 7. Annual refined lead market balances.

depressed lead price in the late 1990s has excited a rash in new investment in lead mining capacity. This, of course, is not the case.

Lead mine production is now highly dependent on the fortunes of other metals. The surge in mine supply currently underway is mostly due to the commissioning of Broken Hill Proprietary’s Cannington mine in Australia, an operation whose economics are largely based on the silver content of the ore. In addition to this, a rash of new zinc mines is leading to increases in lead concentrate as a by-product; the Western Metals Pillara operation, the Lisheen mine in Ireland, and Pasmenco’s Century project all add to this boost. A total of 200,000 tonnes of lead in concentrate could be added to the market next year, potentially the largest single-year increase in lead mine supply for three decades. Smelter production will react to this surge, and absorb at least half of the anticipated extra

production. Again, this is not due to a rash of new investment, as the building of lead smelters is far from attractive in the current environmental climate. Nevertheless, several incremental expansions and higher utilization rates will boost refined lead supply. In summary, 200,000 tonnes of mine supply will result in 100,000 tonnes of extra metal. The outlook for demand is therefore highly relevant.

Fortunately for all industry participants, lead consumption growth is due for an upturn, and its forecasted that much of the 100,000 tonnes increase will be absorbed by increases in Western European and North American consumption. A rapid recovery in Asian consumption is not expected, mostly due to the lost growth in automobile populations over the past 2 years, which is now flowing through to a slower demand for replacement automotive batteries. The sum total of the quarterly projection (Fig. 4)

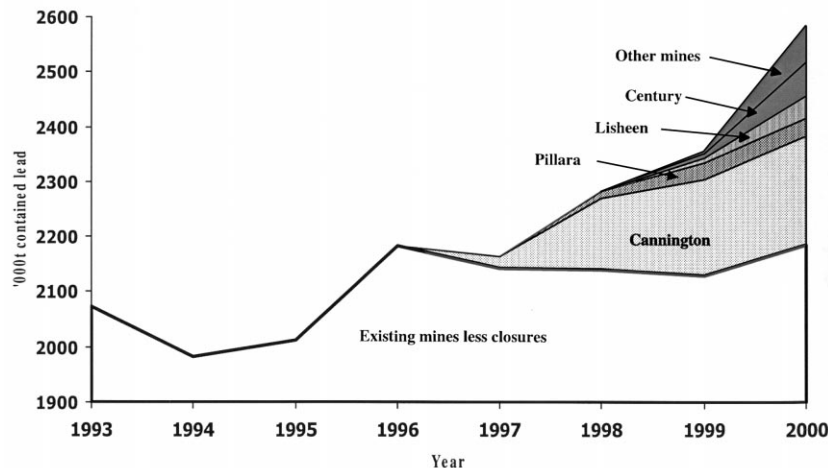


Fig. 8. Increase in mine production 1993–2000.

is a market in deficit by approximately 10,000 to 20,000 tonnes of refined lead.

Such a forecast needs to be approached with some caution as the outlook for production is almost guaranteed. Barring some unforeseen closures (a cloud currently hangs over a handful of lead smelters on environmental grounds), primary lead production will rise as a result of higher mine output. This increase in mine output is largely firmly committed, and the majority of new mines are primarily dependent on other metals for revenue — hence, they are less reactive to lead market conditions. For at least the next two years, therefore, the lead concentrate market will be in surplus, and will tempt primary smelters to increase capacity utilization and produce lead — even if there are no ready markets for such lead.

The 100,000 tonnes rise in consumption is more tenuous. Therefore, a forecast of a market roughly in balance, while not quite a best-case scenario, is certainly towards the more bullish range of possibilities. This is the environment in which lead prices will be determined. Before progressing on to an actual forecast, it is best to cover first a few other aspects of this environment and how they have been impacting upon lead prices.

## 7. Non-fundamental forces on lead prices

In the past, LME lead prices have reflected underlying fundamental market forces. Over time, an inverse relationship between stocks and prices can be tracked. This is normal, and in fact holds for most metals. Higher demand and tight markets will pull stocks down and push prices up. This historical relationship can be modelled, and the fundamentally justified prices indicated in Fig. 9 are the prices that are predicted by CRU's model given the state of the physical market over time.

The historical relationship holds surprisingly strongly up to late-1997, then clearly dissolves. Late-1997 is the onset of the Asian financial crisis and a collapse in confidence in several markets, the LME included. This is an important point. If not for the depressive effect of the Asian crisis across base metals, on the basis of the fundamentals of the lead market, consumers may have been paying closer to US\$700/tonne for lead over the past year rather than US\$ 500/tonne.

Lead, of course, is not alone. All metals have been depressed since late-1997 as the market came to expect a slump in global demand for manufactured goods. Certainly, this was evident in Asia with sharp deteriorations in consumer purchasing power and consumer sentiment. Twelve months ago, the outlook for the USA was also looking questionable, as demand was being supported on the fragile foundation of over-inflated equity prices and the wealth-effect of higher stock prices. Granted that, in retrospect, this view is easily criticized, and in fact, as all have come to witness, inconsistent. The severe reaction of commodity markets in general to worries about US growth has paradoxically allowed the US economy to import disinflation. Lower prices for raw materials have removed inflationary and interest rate pressures, leaving growth and equity prices high. It is increasingly the brave forecaster who calls an end to the current record cycle of US economic expansion in his/her projections. But this view has prevailed for at least the past 18 months. Lower US consumption growth and unabated production have been expected to push metal markets into surplus.

Prices of metals reacted accordingly. As shown in Fig. 10, with the exception of the price of tin, prices of LME metals have declined quite consistently over the past two years. The lead price has not fared as badly as copper or zinc in relative terms, but is down by 20% on August 1997 levels.

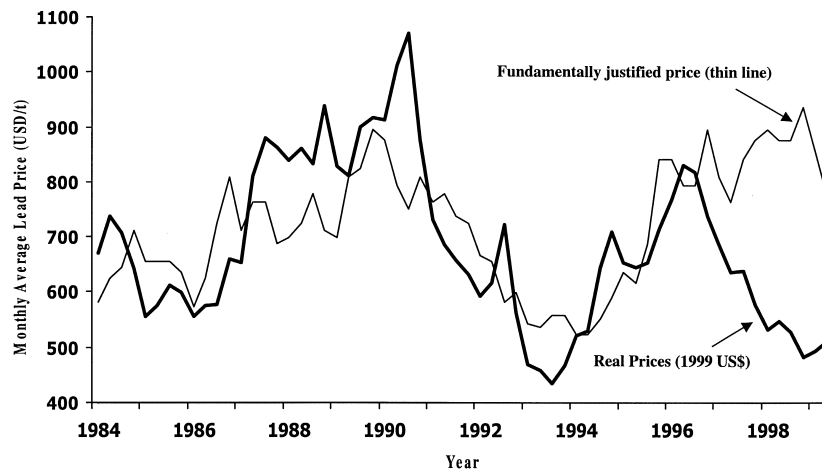


Fig. 9. The diversion between real and fundamentally justified prices.

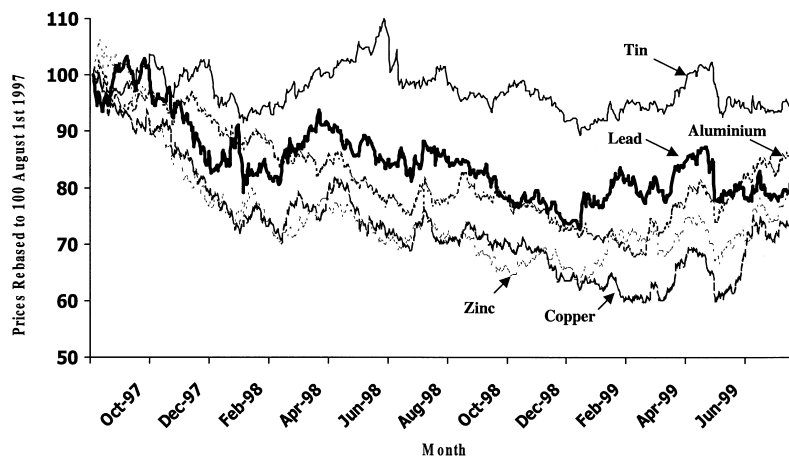


Fig. 10. Comparative LME metal prices re-based at 1 August 1997.

Considering price movements since 4 January 1999 (Fig. 11), it is evident that lead has been left behind in the recent upswing in copper, aluminium and zinc prices. After a small price rally in April, lead now lags copper, aluminium and zinc in relative terms by approximately 10%.

Using relative price movements to comment on the direction of lead prices may seem a little incongruous. It could be argued that the fundamentals of the copper, aluminium and zinc industries has little to do with the lead industry. The relevance of lead price movements to those of other metals therefore deserves some detailed consideration.

The volume of trade on the LME is dominated by the copper and aluminium markets (indicated in Fig. 12 in terms of tonnes traded by month). Lead is the very small area on the top of the presented data. Of course, the lead market is smaller and, therefore, should have lower volumes, but correcting the turnover figures for the relative sizes of each market reveals lead's position more clearly. On expressing turnover in terms of tonnes of annual

production for each metal, it is found that the highest relative turnover is, a little surprisingly, tin at 48 times world production. Next follows copper at 40, nickel at 32, aluminium at 25, zinc at 21 and, way behind, lead at 12 times. Correcting again for the relative value of each metal would push lead even lower in relative terms. Of course, it appears strange that for every tonne of metal produced, so many more tons are traded on the LME. The LME is a very active market, however, and the turnover data reflects positions being rolled forward again and again, every hedge trade, every option trade and many other derivatives that result in futures and options turnover to support them. LME stocks are bought and sold many times in a year.

Why is lead so lightly traded? In the author's opinion, the low liquidity is related to two key reasons: first, the lack of speculative interest; second, the lack of trade hedging.

The increased role that funds and speculative investors take in the base-metal markets is a topic in itself. In terms of the lead market, it is sufficient to say that lead rates very lowly as a preferred investment metal. The industry

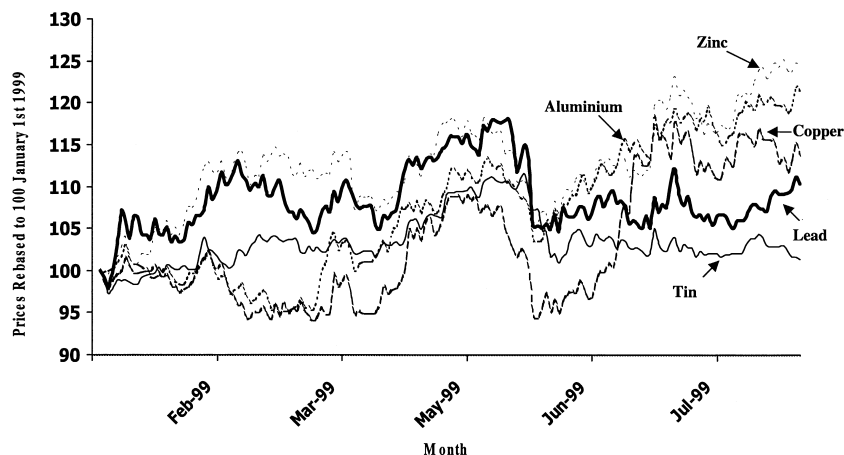


Fig. 11. Comparative LME metal prices re-based at 1 January 1999.

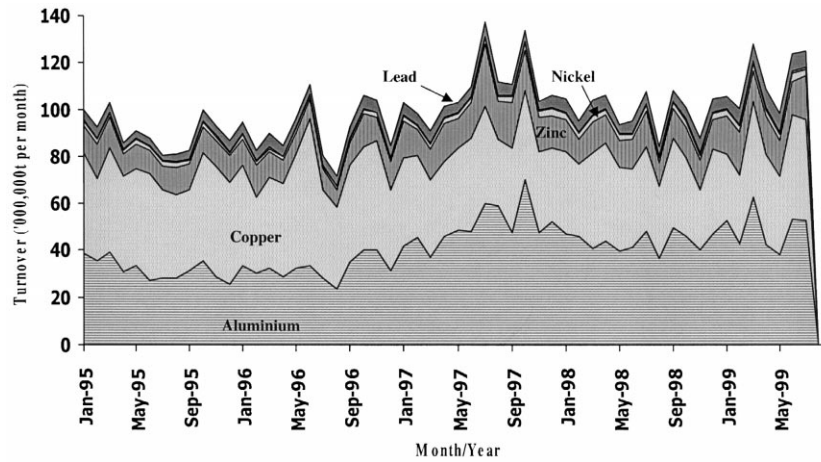


Fig. 12. Relative LME turnover in futures and options.

has a far higher proportion of non-public ownership and, therefore, does not allow fund investors to take complimentary equity and metal futures positions. In addition, as the market is thin and tightly held, many non-trade investors are wary of being squeezed.

In terms of trade hedging, there are significant structural reasons for the lack of volume. In the case of copper (the other metals hold similar pictures), for example, there are several steps in delivering the product through to final consumers. The metal is mined, smelted, refined, stocked, fabricated, stocked again, then sold. At each of these distinct points, a price risk occurs and requires each person in the chain to contemplate and perhaps cover his/her exposure. Lead, by contrast, is quite different. Over half of lead comes directly from secondary smelting. Secondary smelting has structurally less exposure to price swings. It is difficult to cover exposure to the scrap industry, which often moves independently to the LME lead price. In addition, in the 1990s there has been an emergence of integrated secondary smelters and battery producers —

Exide and GNB are typical examples of consumers who are integrating backwards into secondary production. Within this cycle of scrap and finished batteries, there is little need to go the market to protect a price risk.

In terms of primary smelters, integrated miners/smelters often abandon detailed hedging programmes and prefer to rely on natural hedges at particular operations or avoid altogether potential exposure through incorrectly taking a market position. Battery consumers generally do not hedge prices (note, there are notable exceptions) — rather, they rely on the reaction of open-market battery prices to cycles in the lead price.

Therefore, although the entire lead industry generally prices with reference to the LME, not much of it actually uses the exchange. LME warrant concentration data highlights the fact that over 50% of all LME warrants are frequently held by just one or two parties.

This lack of liquidity is evident in the trading pattern on the exchange. LME metals are ring traded by open outcry in London. Each metal's daily settlement price is deter-

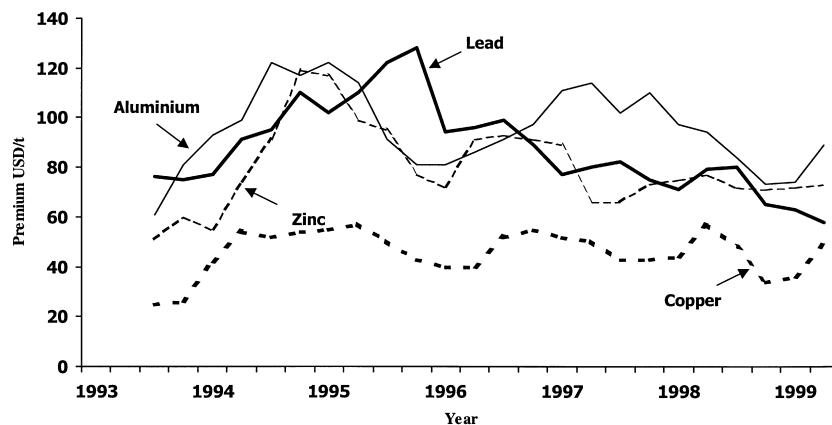


Fig. 13. Relative physical metal premiums.



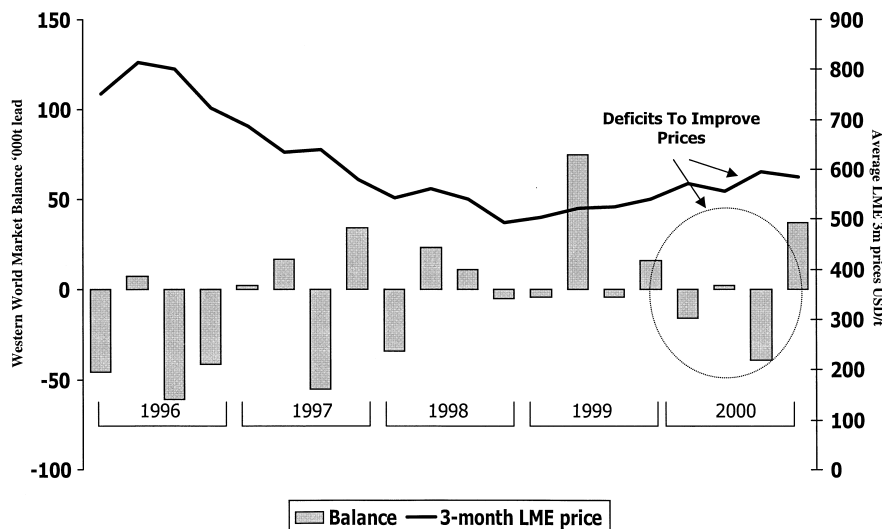


Fig. 14. Market balance and prices.

mined by the final trade of 5 min open outcry sessions shortly before lunch. The lead ring — the 5 min that determines lead prices — is often the slowest and quietest ring of all metals. It is in this quiet, thinly traded environment that lead prices are determined.

Much of the market action in lead is reflected elsewhere, in physical metal premiums. In fact, as Fig. 13 indicates, physical premiums for lead are occasionally higher than premiums for other metals (not even taking into account lead's low value — in relative terms, the premium are even higher). The premiums also vary far more than other metals, both in absolute levels as well as in regional differences. This may be de facto producer pricing. In fact, recent moves by leading secondary producers in the USA have been altogether away from LME pricing.

Certainly there is an environmental argument to be considered. During a period of very low prices, it is often at the scrap collection stage that a supply response is triggered. As mentioned earlier, primary production is increasingly price inelastic, as mine production is becoming more dependent on prices of other metals. Producer pricing requires, however, a completely different argument. Here, it is appropriate to return to LME pricing and the outlook for next year.

## 8. Price outlook

CRU forecasts that 1999 is likely to be a year of surplus, and at 80,000 tonnes, a reasonably sizeable surplus in the context of the past five years. CRU forecast that 2000 will be a year of minor deficit and, therefore, can be considered virtually as a balanced market.

Due to non-fundamental pressures on lead pricing, lead has been relatively undervalued since 1997 as a consequence of a generally depressive environment on the LME.

Now that there are clear signs that this environment is changing, the lead market is poised for higher prices.

As long as consumption growth returns at a moderate rate and the surge in mine output meets some difficulty in finding its way through to refined metal, lead prices will increase. CRU's fundamental outlook dictates that there will be no significant negative news to turn sentiment towards lead negative. Presently, sentiment is highly relevant. Twelve months ago, the outlook for demand in many metals appeared grim, and most industry participants were steeling themselves for significant surpluses.

The mood now is quite different. The US economy continues to grow unfettered by inflationary pressures, and the outlook for many Asian economies is brighter. This is not to say that these economies have entered clear water, but US equity markets disagree as do, increasingly, metals. Copper was the first to react strongly, with closure in mining and smelting capacity in the US, which has since buoyed prices. Aluminium is also off its low, and even in the zinc market, where significant new mining and smelting capacity is being brought on stream, prices have been stronger than usual. Lead, given its neutral fundamental outlook for the next 12 months (and its relative low value in historical terms), is free to participate in this general rally in prices.

CRU therefore forecast moderately higher prices (Fig. 14). A 10% increase on average will go some way to closing the gap between fundamentally justified prices and the prevailing LME price, and will also allow lead to catch up the ground lost to other metals over recent months. A 10% increase will mean average LME 3-month prices in 2000 of US\$570/tonne, i.e., US\$50 higher than the forecast for 1999 of US\$520/tonne. Spot prices may rise well above this average, especially during the peak third quarter demand, and are likely to breach the US\$600 level for a brief period at some stage, most likely in the second half of Year 2000.