

Viewpoint

Sustainable development: can the mining industry afford it?☆

D. Humphreys \*

Rio Tinto Plc, 6 St. James's Square, London SW1Y 4LD, UK

Received 30 January 2001; received in revised form 8 February 2001; accepted 10 February 2001

Abstract

Adopting the values of sustainable development implies an increase in the mining industry's environmental and social costs. For an industry already offering poor returns on capital this is potentially a problem. An examination of the historical record, however, reveals that past increases in environmental and social costs have been more than offset by developments in industry productivity. The emergence of information and communication technologies seems likely to extend this trend into the future. The particular challenges being faced by mining in the US appear to be less to do with rising environmental costs than with competition from countries which have recently opened up to foreign mining investment and to a strong dollar. It seems likely that industry's adoption of more sustainable practices will require, and could even promote, improved returns to capital in mining. © 2001 Elsevier Science Ltd. All rights reserved.

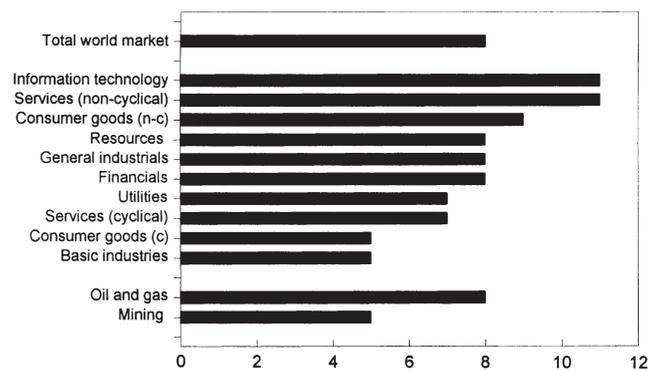
Keywords: Mining profitability; Sustainable development; Environmental costs; Productivity; Information and communications technologies; USA

The proposition to be explored in this paper is that the profitability of the mining industry — already poor — is about to get worse as a result of rising cost pressures associated with the social and environmental demands of sustainable development. A secondary objective is to ask whether US miners are set to suffer disproportionately in this process.

Profitability and cost pressures

It is certainly the case that the financial history of the mining industry is an undistinguished one. As Fig. 1 illustrates, data going back over the past 27 years reveal that the resources sector as a whole has achieved a reasonably respectable 8% average real rate of return on capital. However, this achievement is entirely down to the oil and gas sector which in 1999 had a market capitalisation some eight times that of mining. Real returns for mining have been a much more modest 5%, pos-

Annualised total shareholder returns 1973-1999, % real



Source: Datastream International, Historical Analytic Services

Fig. 1. Profitability by industry sector.

itioning it alongside so-called “basic industries” such as steel, construction, forestry and chemicals.

This is the background against which the mining industry now confronts the possibility that cost pressures on it are about to intensify as a result of increased social and environmental demands associated with a move to sustainable development.

There is an argument, which generally goes under the heading of “eco-efficiency”, that environmental improvements go hand in hand with improved industry efficiency. In other words, there are “win-win” opport-

☆ This paper is based on a presentation at the Northwest Mining Association's 106th Annual Meeting, “Winds of Change”, 4–8 December 2000, Spokane, WA, USA.

\* Tel.: +44-171-930-2399; fax: +44-171-930-3249.

E-mail address: david.humphreys@riotinto.co.uk (D. Humphreys).

unities which avoid the necessity of making difficult trade-offs between what makes good business sense and what is good for the environment. Higher mineral recoveries obviously mean less waste and lower waste disposal costs, while higher energy efficiencies mean less carbon emissions and lower operating costs.

There is undoubtedly much in this argument. However, it is far from the case that *all* expenditures on social and environmental matters bring about cost-savings.

Many such expenditures are a straightforward internalisation of that were previously external costs; which it to say, costs picked up by society at large in the form of the degradation of air or water, or the despoliation of landscapes. The reinforcement of a tailings dam or the sterilisation of part of an ore body for environmental reasons may allow a miner to continue in business but they generate no rates of return. The same applies to the reclamation and rehabilitation of worked-out mine sites. Community programmes are real costs, without necessarily any immediate offsetting efficiencies. So also are the permitting costs which miners must incur before they have cash-flow, always assuming, that is, the permitting process enables them to get one.

Quite what the scale of these internalised costs is it is hard to determine. This is partly because some cost-savings, of the eco-efficient variety, would have been done anyway, while others are not specifically identified as social and environmental costs but treated as a normal part of doing everyday business. Company accounts do not typically contain headings distinguishing environmental costs, and those identified as social costs will tend only to relate to specific programmes.

Were it possible to break out the role of social and environmental costs, they would probably not be that high anyway for the simple reason that many of these activities are today built into the way projects are set up to run. (This will not necessarily be the case at older operations where companies are having to play catch-up.) For the most part, it is more likely that additions to costs arising from higher environmental and social standards will be found in the capital component of mine projects.

In one of the few attempts to put numbers on these things, Metals Economics Group (1993), in a survey of gold companies in 1993, found that respondents considered environmental provisions accounted, on average, for only 3% of their operating costs. However, they claimed they accounted for around 12% of their feasibility costs and 14% of their development costs, with the figures rising to 22% and 17%, respectively, in more demanding jurisdictions. Data produced by Statistics Canada (1997) show environmental protection accounting for some 23% of capital expenditures in the mining sector and, on a totally different definitional basis (one which includes “any expenditure that ensures or anticipates compliance to environmental regulation or official

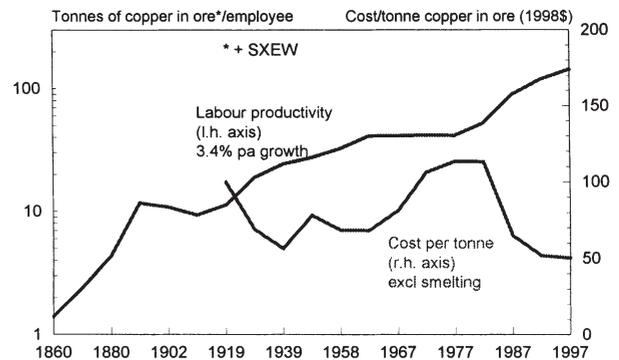
voluntary agreement”), for 77% of operating expenditures. But whether incurred in operating or in investment, these are still real costs which make tougher the challenge of an industry seeking to improve its returns on capital.

## Productivity and industry returns

Against this backdrop, it might seem likely that the arrival of sustainable development as a social objective generally, and as an objective for the mining industry in particular, must, by adding to costs, compromise its profitability further. There are, however, certain problems with this notion. Not the least of these is that the industry has been improving its standards of social and environment performance over very many years already, during which time mining costs have fallen substantially. How is this so?

Here we encounter one of the great unsung achievements of the mining industry, its extraordinary and sustained growth in productivity. The record of productivity growth has enabled the industry to offset rising costs associated with the adoption of higher social and environmental standards, combat the tyranny of declining ore grades and, over some periods, *still* achieve a reduction in real costs of production. Indeed, this decline in real terms production costs is the basis for the long run decline in real prices of many commodities.

A particularly fertile source of information on US mining productivity is the US Bureau of the Census. This permits analysis of the mining industry back to 1860. Looking first at its data on copper, it can be seen in Fig. 2 that over the past 140 years, labour productivity per tonne of copper contained in ore has increased at an average rate of 3.4% a year, a total improvement for the period as a whole of over 100 times. Moreover, as indicated by the logarithmic trend, the rate of improvement has been remarkably consistent over the period covered. Considering the productivity of ore milled rather than copper contained in the ore — in many respects a fairer



Source: US Bureau of the Census, *Census of Mineral Industries*, various editions.

Fig. 2. Productivity growth in US copper mining.

متن کامل مقاله

دریافت فوری ←

**ISI**Articles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات