

The response by the Norwegian aluminium industry to changing market structure

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Abstract

This paper analyses how changes in market structure have affected the margins (measured by the Lerner index) of Norwegian aluminium plants. Instead of showing the expected negative trend, due to increased competition internationally, the margins are found to move procyclically around a constant that significantly exceeds zero. Three explanations for this stability in the levels of the margins are identified; a better exploitation of scale economies, increased productivity and product specialisation which allows Norwegian producer prices to increase more rapidly than the international reference price. © 2001 Elsevier Science B.V. All rights reserved.

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1. Introduction

For several decades, the aluminium market has been affected by an increase in the degree of competition internationally, i.e. a decline in industry concentration. While the six dominant companies, Alcan (Canada), Alcoa (USA), Alusuisse (Switzerland), Kaiser (USA), Pechiney (France) and Reynolds (USA), accounted

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for 86% of world capacity in 1955, they accounted for 73% in 1971, 62% in 1979, and 40% in 1993.¹ In the early post-war oligopoly setting, prices were set to cover costs plus a margin (Rønning et al., 1986). Over time the industry has changed to be more competitive and less oligopolistic, cf. Reynolds (1986, p. 231) and Froeb and Geweke (1987), and fringe plants have had a significant impact on price determination since the mid-1970s. Today, the price of aluminium on the London Metal Exchange (LME), where aluminium has been traded since 1978, is of major importance to most trade in aluminium. It is common for producers and consumers to enter into long-term contracts specifying quantities, grades and shapes, while the price is related to the LME-price, often at the time of delivery.

It is generally assumed that this change in market structure has put a downward pressure on the margins in the aluminium industry. Margins are measured by the Lerner index (Lerner, 1934), i.e. as price minus marginal cost divided by price. The Norwegian aluminium industry, which exports most of its production, has responded to the change in market structure in a number of ways. As a result of plant closures and mergers, the Norwegian aluminium industry has been dominated by two companies since the mid-1980s. These are Elkem Aluminium, which owns two aluminium plants, and Hydro Aluminium, which owns four plants and is a major share-holder in a fifth. This consolidation on the producer side has probably provided the basis for other important strategic actions; over time, both upstream and downstream integration have become increasingly important. The access to alumina, which is the major raw material in this industry, is secured by vertical integration and long-term agreements. And Elkem, which is strategically related to Alcoa, delivers a substantial part of its production to Alcoa's manufacturing plants, while Hydro has built up an extensive semi-manufacturing system in Europe and North America. The aluminium is primarily sold using long-term contracts. Furthermore, reading their annual reports, it is clear that both companies have adopted strategies to specialise products and increase their productivity.

While some of the actions described above are likely to reduce production costs, others, such as the effort to specialise products, may help Norwegian plants to sell at a price above the LME-price, that is at a premium. To what degree these actions have neutralised the negative competition effect on margins is an empirical issue, which we will try to resolve in this paper.

Earlier studies of the aluminium industry have in general assumed fixed input coefficients and constant returns to scale. (One exception is Reynolds (1986), who calibrates alternative variable cost functions for the US aluminium industry.) As a consequence, the standard approach when calculating margins involves using a measure of average variable costs, see Froeb and Geweke (1987), Domowitz et al. (1987) and Rosenbaum (1989) who all analyse the US aluminium industry using

¹Sources: Bresnahan and Suslow (1989, p. 280) and information provided by Hydro Aluminium, Oslo.

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