Aluminum Production Costs: A Comparative Case Study of Production Strategy

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Aluminum Production Costs: A Comparative Case Study of Production Strategy

Joseph Nloga Ndjebayi, DBA

Abstract
Slumping world aluminum prices have energized some aluminum producers to institute strategies to reduce product costs. This multiple comparative case study explored the strategies used by 4 aluminum producers in Western Europe: 2 companies that have successfully reduced production costs and 2 companies that have not. Wicksteed’s economic theory of production and production costs served as the conceptual framework for this research. Data were analyzed using pattern finding, a recursive approach to data analysis established by Miles, Huberman, and Saldana. Six themes emerged: (a) upstream integration, (b) energy and price efficiency, (c) carbon-manufacturing capability, (d) operational excellence, (e) technological and research developmental abilities, and (f) circular economy.

Problems
Aluminum commodity prices fell by 24% from 2008 until 2013, and the prices remained below marginal production costs for many producers because of persistent global aluminum outputs that continued to surpass demand (World Bank, 2013). The raw material prices increased across metal markets by over 20% (Trench, Sykes, & Robinson, 2015). While many aluminum producers experienced declining profitability and adverse production costs, some producers lacked the strategies to reduce production costs.

Purpose
The purpose of this study was to explore the strategies that some aluminum producers in Western Europe might implement to reduce production costs and to sustain the business. I studied four companies to compare production strategies: two companies that were achieving sustained production costs and two that were not. I used semistructured interviews of senior managers and analyzed documents to identify core concepts that producers may develop into strategies to reduce production costs.

Relevant Literature
Three streams of literature were available for this study: The economic theory of production: three important concepts (a) technical efficiency and production frontier (Cobb & Douglas, 1928; Farrell, 1967), (b) allocative efficiency (Restuccia & Rogerson, 2013), and (c) flexible operational modes (Ajmal, Hussain, Kristianto, & Tenkorang, 2012). The economics of scale and backward integration (Miltonburg, 2006; Porter, 1980). Circular economy (Tukker, 2015).

Social Change Implications
The findings may:
- allow companies increasing their business sustainability by optimizing their use of resources and energy consumption.
- allow companies using circular economy models to reduce material consumption and waste, which contribute to environmental protection.

Procedures
I selected 4 companies paired into two categories that could yield literal and theoretical replications along two theoretical dimensions: (a) production costs and (b) production strategies. I used semistructured interviews and documents analysis to triangulate core themes.

Social Change Implications
The findings may:
- allow companies increasing their business sustainability by optimizing their use of resources and energy consumption.
- allow companies using circular economy models to reduce material consumption and waste, which contribute to environmental protection.

Limitations
Limitations may have included:
- Difficulty to negotiate the permission for entry to perform site observations because companies were reluctant about issues of confidentiality. These restrictions limited the possibility to observe core processes and assets.
- Some participants had discomfort when disclosing sensitive information about their company’s strategies.

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