

MEASURING DIFFERENTIAL OPERATION PERFORMANCE OF FACILITY MANUFACTURERS IN THE HEAVY INDUSTRY

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ABSTRACT

Heavy Industry has been struggling since the economic crisis that began in 2008. One of the hardest hit industries is the companies that produce carbon steel sheets and coils. The quantity produced exceeded the demand for steel creating a surplus. China, for example, had produced 700 million tons in 2009 even though the estimated demand was only 490 million tons. This created a surplus of 210 million tons in China for that year alone. Other steel producing companies in other countries did not fare any better than China.

The focus of this research is to determine the operating efficiencies of the facility manufacturers who supply the facilities and key accessories to ferrous and nonferrous producing companies with an emphasis on coil producers. The research will show if the facility manufacturer will perform a better operating performance to resist the economic impact or if the economy had not affected the industry as previously assumed.

The data envelopment analysis (DEA) will be employed to estimate operating efficiency. Then a cross analysis will be used to compare the results with the pricing information to identify the influence of the global economic trend. The analysis will give a thorough understanding of the deviation in operating efficiency among the chosen companies. Five similar facility manufacturers, within the heavy industry, were chosen for this analysis. The results should show the different operating efficiencies for each company.

Four years of financial reports (2008-2011) were used for the DEA analysis. "Cost of Sales", Selling and Administrative Expenses", and "Depreciation" were chosen for the inputs of the DEA Expense model. "Cash and Cash Equivalents", Inventory", and "Property, Plant, and Equipment" were chosen for the inputs of the DEA Asset model. "Net Sales" was chosen for the output for both the Expense and Asset models. The DEA results were expressed by the BCC-I, CCR-I, and SBM-I-C models.

These DEA results were cross analyzed to compare the operating efficiencies with material prices within the four year time frame of 2008-2011. The focus was on "Scrap", and "Nickel" materials that significantly influence the cost of production. Coal is not a strong factor because electric furnaces are mainly being used by the target facility manufacturers to smelt carbon steel and stainless steel. The results showed that some of the target facility manufacturers have a better operating efficiency than others even faced economic impact. This proves that the facility manufacturer of heavy industry can still have better performance to resist economic impact as previously assumed.