

# MERGERS AND ACQUISITIONS IN THE CONSTRUCTION INDUSTRY

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A feature of the construction sector for the past year has been the increase of corporate activity, with mergers and acquisitions at the forefront of most firm's strategies. Consolidation, by mergers and acquisitions, in the construction industry is leading to the big firms getting bigger and the small to medium companies finding it increasingly difficult to maintain competitiveness and margins. The motives behind this wave of consolidation, is the fact that financial institutions want to deal with larger companies, but also the belief that the larger the firm the greater the efficiency. Mergers are justified by the extent to which they add value, adding value requires some synergy which may be obtained by winning access to complementary assets or deriving economies of scale or scope related to the core business. There would be a significant incentive for companies to grow if the costs of production were to decrease as the scale of the operations increased.

Against this background, this paper measures the benefits of size, by estimating the relation between a measure of costs and a measure of size. The Data were selected from over one hundred companies from the contracting and house building sector, materials sector and plant hire for each of the most recent five years.

Keyword: acquisitions, construction sector, merger, regression market sector, scale economies.

## INTRODUCTION

Merger and acquisition activity in the UK has grown rapidly since the recession in the early 1990s. 'A merger and acquisition strictly defined, occurs when an operating enterprise acquires control over the whole or part of the business of another enterprise (Kang and Johansson 2000). Overall merger activity has increased dramatically over the past decade. The latest figures from the national statistics office (Table 1) reinforce this viewpoint.

Expenditure on acquisitions of companies by UK companies increased from £13 billion to a record level of £285 billion. The level of expenditure on acquisitions in the UK by overseas companies has also increased dramatically.

A feature of the construction industry in the past five years has been the increase in corporate activity. This activity is leading to consolidation within the industry. 'Aggregates and building firms have been experiencing unprecedented consolidation as multinationals go in search of geographical presence and economies of scale' (Construction News, 2000). The motives behind this wave of consolidation, is the fact that financial institutions want to deal with larger companies, but also the belief that the larger the firm the greater the efficiency. Hopkins *et al.* (1999) examines four related motives for the use of mergers and acquisitions: Strategic, market, economic

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and personal. This paper focuses primarily on the economic motives. One important economic motive for acquiring is to establish economies of scale.

**Table 1:** Summary of Mergers and Acquisitions in the UK (National statistics 2001)

Years	Transactions By UK Companies	Transactions in the UK by overseas companies
	Value £million	Value £million
1992	13 205	4 139
1993	16 276	5 187
1994	23 433	5 213
1995	44 567	12 817
1996	44 119	9 513
1997	46 005	15 717
1998	84 442	32 413
1999	137 356	60 860
2000	285 671	63 990

Economies of scale are a measure of the extent to which the costs fall as output expands, size appears to be viewed as a principal source of competitive advantage. There would be a significant incentive for companies to grow if the costs of production were to decrease as the scale of the operations increased. Mergers have emerged as one method of striving for operating efficiencies, mainly focused on the cost side (Avkiran 1999). This paper provides an assessment of the benefits of size by estimating the relation between a measure of costs and a measure of size. Financial data on the largest companies from the contracting and house building sector, materials sector and plant hire sector were used in the following analysis.

## ECONOMIES OF SCALE

To date, most of the available knowledge on mergers and acquisitions comes from the scrutiny of the financial services and technology industries. Much of the literature has focused on the benefits and impact of bank mergers, Cybo-Ottone and Murgia (2000), Becher (2000), Berger (1999). There has been little research examining the benefits of mergers in the construction industry. Siehler (1998) briefly examines the role of mergers in globalization in construction. Ball *et al.* (2000) examine efficiency and competition as a scale effect.

The motives cited for launching take-over bids usually reflect the anticipated benefits that a merger or acquisition is expected to generate, one such benefit is to exploit scale economies. Exploitation of scale economies can occur in any of three major ways. First, a merger could improve cost efficiency by reducing the costs per unit of output. For example where plant and equipment is of an expensive nature, costs may be reduced by combined use. Second, mergers may exploit economies through improvements in profit efficiency. Profit efficiency takes into account the cost and the income or revenue effects. Thus, profit efficiency can improve after a merger without the actual cost efficiency improving. If for example the merger increases revenue without increasing or decreasing costs. The third way, in which mergers or acquisition may be expected to yield scale economies, is through access to capital markets on more favourable terms. An increase in market concentration or share may allow the consolidated company to raise the rates for the goods or services provided by the company.

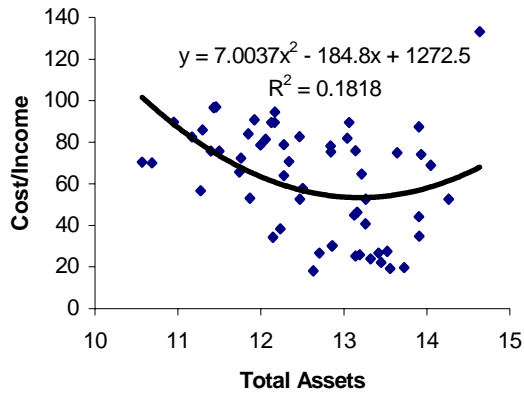
## **SAMPLE SELECTION**

The sample used for the analysis in this paper was taken from the three main sectors in the construction industry. The problem faced when selecting the sample sizes is the distribution of firms. In each sector, particularly the materials and plant hire sectors, there is a group of very large firms that often straddle construction and other industries and then a much larger group of smaller firms beneath them. To aggregate together very large firms with smaller, but still relatively large contractors makes little economic or statistical sense. As a result the sample was selected to exclude those particularly smaller companies. This resulted in a downsizing of the sample from each sector. Approximately sixty of the largest U.K companies from the contracting and house building sector was selected for the purpose of the following analysis. The size of the sample from the materials and plant hire sectors was restricted to approximately thirty companies. The companies reports and financial details were taken from the FAME database.

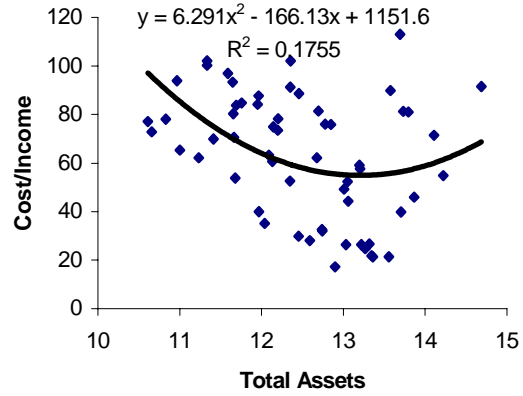
## **ANALYSIS OF SCALE ECONOMIES**

The purpose of this analysis is to measure the benefits of size in terms of cost efficiency. To achieve this aim the financial data on the largest U.K companies from the three main sectors in the construction industry were selected for the purposes of this analysis over a period of five years. The analysis measures the benefits of size by estimating the relation between a measure of costs and a measure of size. The incentive is there for firms' to grow if cost of production falls as income increases. Taking this into consideration a measure of costs was taken as the cost/income ratio, and the measure of size was taken as the total assets of the respective companies. Total assets in the graphs are given in terms of the log value of the assets, the reason for the use of log values, is due to the size of the total assets. Regression analysis was used to assess the relation between scale and cost efficiency, by finding the line of best fit through the plot of data points. Initial testing was carried out examining models that would give the best fit line, linear, logarithmic and polynomial regression were all tested. The model that represents the best fit line is the quadratic model. The charts summarize the results of the regressions. Under each chart the quadratic relation and the value of the regression  $R^2$  are shown. Figures 1-5 show the analysis from the contracting and housebuilding sector. Figures 6-10 show the analysis from the materials sector and figures 10-15 shows the plant hire sector.

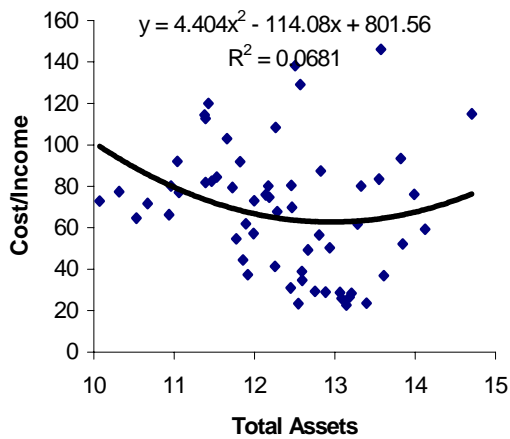
**Fig 1. Cost/Income & Total Assets (1999)**



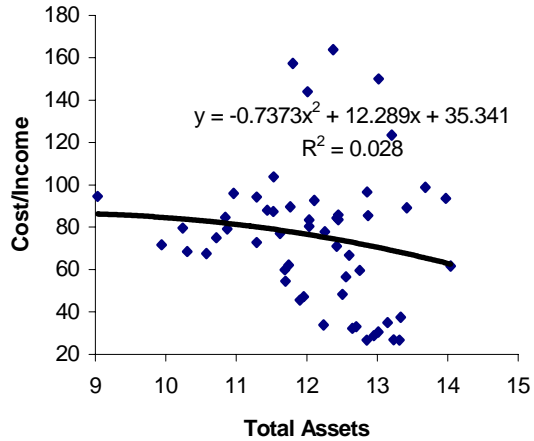
**Fig 2. Cost/Income & Total Assets (1998)**



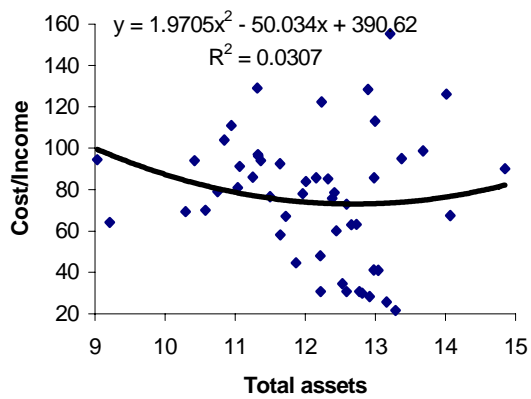
**Fig 3. Cost/Income & Total assets (1997)**



**Fig 4. Cost/Income & Total Assets (1996)**

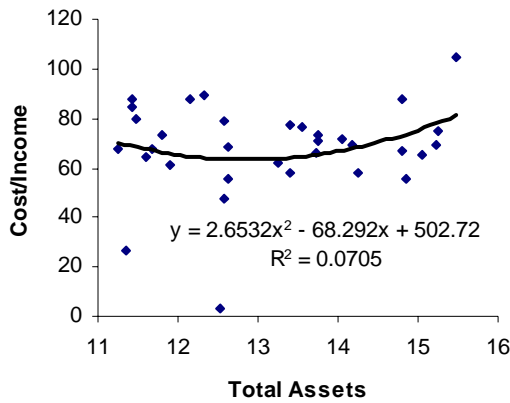


**Fig 5. Cost/Income & Total Assets (1995)**

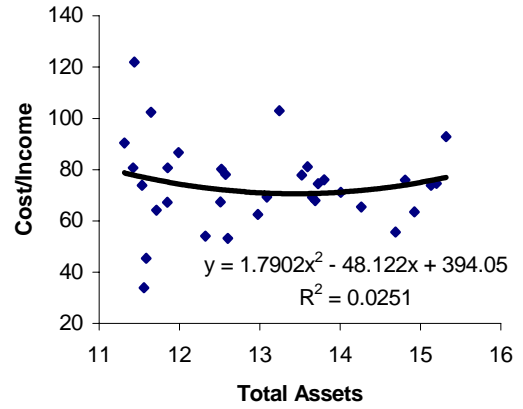


**Figure 1 – 5: Cost/income Ratios and Total Assets for the Contracting Sector**

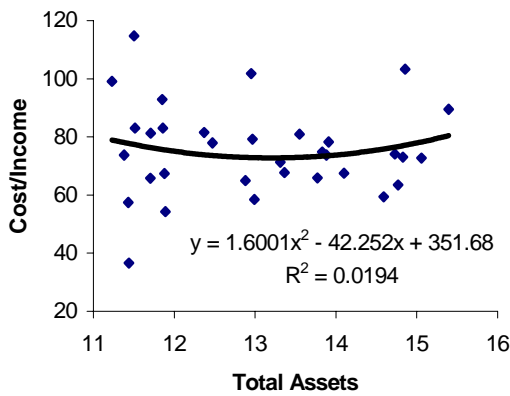
**Fig 6. Cost/Income & Total Assets (1999)**



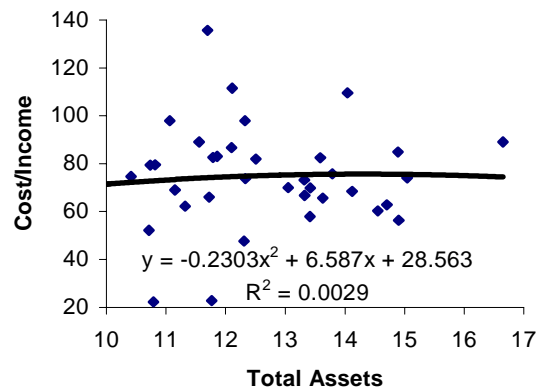
**Fig 7. Cost/Income & Total Assets (1998)**



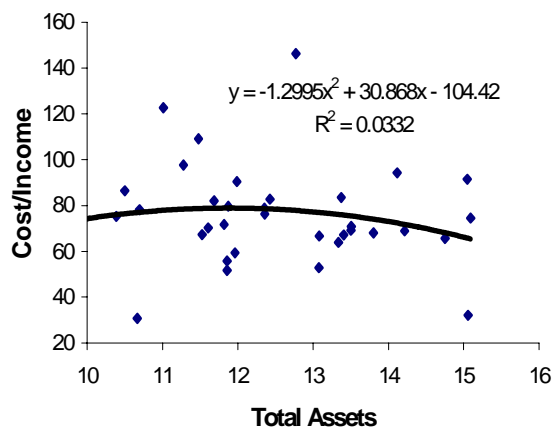
**Fig 8. Cost/Income & Total Assets (1997)**



**Fig 9. Cost/Income & Total Assets (1996)**

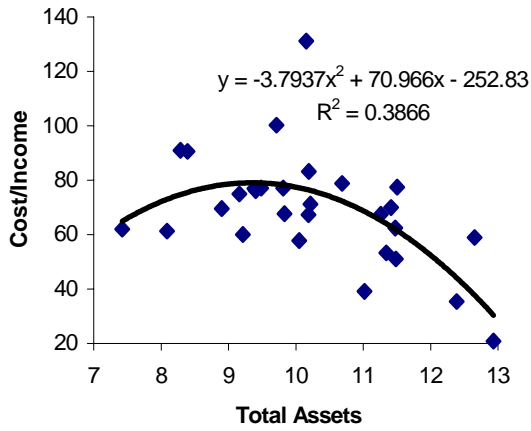


**Fig 10. Cost/Income & Total Assets (1995)**

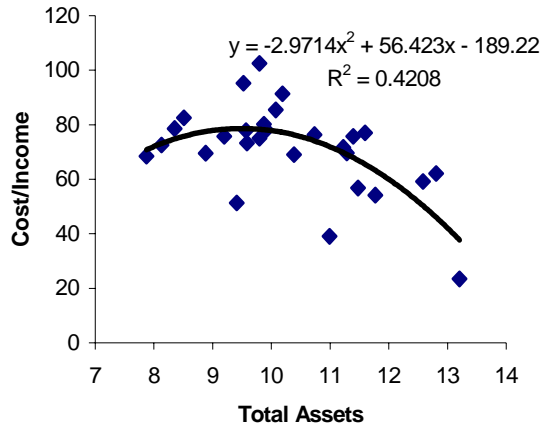


**Figure 6 – 10: Cost/income Ratios and Total Assets for the Materials sector**

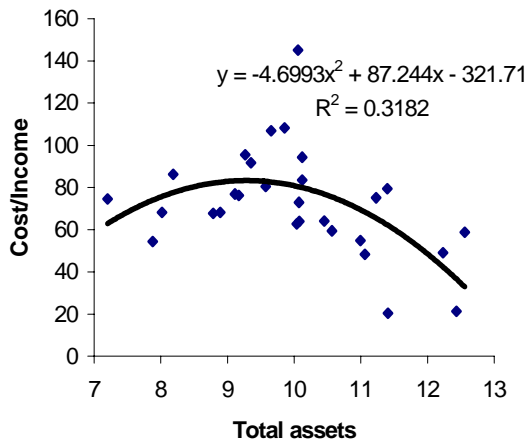
**Fig 11. Cost/income & Total Assets (1999)**



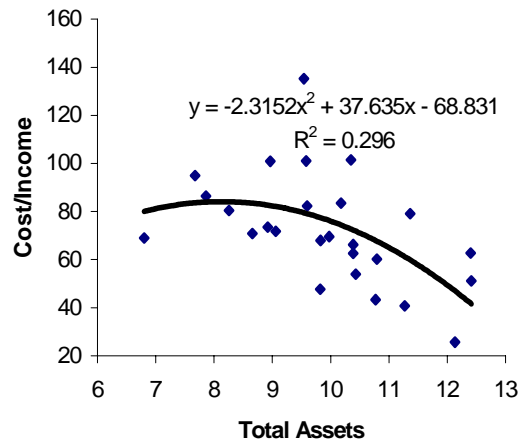
**Fig 12. Cost/income & Total Assets (1998)**



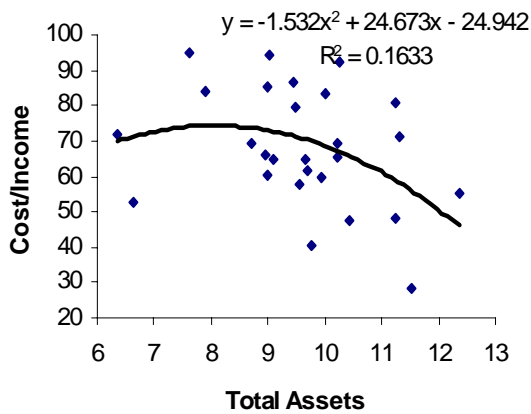
**Fig 13. Cost/income & Total Assets (1997)**



**Fig 14. Cost/income & Total Assets (1996)**



**Fig 15. Cost/income & Total Assets (1995)**



**Figure 11- 15:** Cost/income Ratios and Total Assets for the Plant Hire sector

## SUMMARY AND COMMENT ON RESULTS

There is some evidence of scale economies from the figures above, although it is not clear-cut in some instances. From the graphs the estimated optimum size of assets for each year in the different sectors are given below in Table 2. This optimum size is calculated by determining the lowest point on the u-shaped curves.

**Table 2:** Optimum size of assets for Construction and Materials

Year	Construction	Materials
1995	328,000 (17 <sup>th</sup> )	247707*
1996	1,264,263*	597,195*
1997	540,365 (13 <sup>th</sup> )	540,365 (15 <sup>th</sup> )
1998	597,197 (14 <sup>th</sup> )	660,000 (15 <sup>th</sup> )
1999	540,365 (17 <sup>th</sup> )	412,510 (17 <sup>th</sup> )

Note: all figures are in £'000s

The graph from contracting in 1999 displays a U shaped cost curve, thus enabling the lowest point of the curve to be calculated giving the most efficient size in terms of cost efficiency. This U-shaped curve is evident over the five years of the contractors examined, except for the 1996 analysis. The graph for 1996 shows that as the company grows in terms of total assets, they're cost to income ratio falls. This gives clear indication that for 1996, scale economies is very evident. The size at which the cost efficiency rises again is usually around the 15<sup>th</sup> largest company for the four years. The rank of company with the total assets nearest to the value of the estimated optimal size is given in the brackets in table 2.

For the materials sector, three of the most recent graphs all show a U shaped cost curve, as shown in the 1999 materials sector. However, the graphs from 1996 and 1995 display a inverted U shaped figures, as shown in figure 9 and 10, this indicates that smaller companies display cost efficiencies, if the company grows then it would not realize scale of economies until it reaches a certain size. The results from the analysis are quite promising and do give indications for economies of scale.

The reason why there is a difference in the figures from the materials sector for 1995 and 1996 with that of other years could be due to the fact of an increase in company size from 1995 to 1999. The average size of the 33 largest companies in the materials sector, in terms of total assets, has risen from £721 million in 1995 to over £1,140 million in 1999. Another factor for the difference could be due to the size of the sample. However, to increase the size of the materials sample would mean a large decrease in the average size of the companies. The size at which the cost efficiency for materials rises again is usually around the 15<sup>th</sup> largest company for the previous three years. Interestingly, for 1995 and 1996 the years in which the graphs are inverted, the size at which companies experience the least amount of cost efficiencies is generally around the 15<sup>th</sup> largest company. The studies by Berger (1999) and Lynch (1996), although related to the financial industry, also display scale efficiency gains for the smaller companies.

However, the results from the plant hire sector display complete the opposite in terms of scale efficiencies. All the graphs display an inverted U-shape, thus meaning that the small and very large companies can gain scale efficiencies.

The reasons for the differences in results maybe due to a number of factors. One of the main reasons could be that the size of asset base for a plant hire company is considerably smaller than that of a contracting or materials company. Comparing the average size in 1999 of the 33 largest companies from the plant hire sector with that of

the 33 largest materials firms shows the plant hire average is £76 million compared with £1,140 million from materials.

## CONCLUSIONS

The findings from the contracting and materials analysis suggests that increasing company size, either by merger or acquisition can lead to scale economies. However, the evidence suggests that beyond a certain size the costs benefits appear to become exhausted, this is particularly so for the previous three years in the construction sector and the materials sector. The reasons for these diseconomies could be due to the difficulties of organizing effectively an increasingly large and possibly increasingly diversified business. The results for the analysis were fairly stable, with the exception of the earliest graphs from the material sector, but over the previous three years the graphs have been consistent. The plant hire sector suggests that there are definite cost benefits for large companies, the results are stable from year to year.

Over the five years of the analysis, the average size of the top companies in the construction sector and the materials sector have increased by over sixty percent in terms of their total assets. Comparing the top 100 companies in construction with five years ago, few names in the listing appear to have changed given the amount of corporate activity especially at the top. The most notable change is that firms are getting bigger.

Although, the analysis would suggest slight diseconomies of scale as a company grows beyond a certain size, it does not mean that a company does not benefit in other ways from mergers and acquisitions. It merely suggests that for materials and contracting cost benefits does not seem to be one of them.

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