STUDY REPORT

SR 254 (2011)

Firm productivity variations

I C Page & M D Curtis

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Preface

Productivity performance in the construction industry is poor and the industry trends compare unfavourably with other sectors of the economy. This research identifies labour productivity at a sub-industry level within the construction industry, indicating those sectors that underperform. Profit ratios are also provided, and perhaps unexpectedly a negative correlation was found between average sub-industry productivity and average profitability. Data from the SNZ Business Operation Survey 2009 was used to compare with productivity performance but was insufficiently disaggregated to arrive at useful conclusions. Further work at a firm level, using longitudinal business data, is recommended to see how a firm's behaviour affects productivity performance.

Acknowledgments

This work was funded by the Building Research Levy.

Note

This report is intended for owners of construction industry firms to enable them to compare their profit performance with similar firms within their sector. Data is provided on labour productivity by sub-industry, which will be of interest to researchers and others concerned about improving the construction industry's performance.

Firm productivity variations

BRANZ Study Report SR 254

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Abstract

The research examines the variations in productivity and profit margins between construction firms at a sub-industry level. It finds a large spread in productivity and profits within and between sub-industries. Firm owners can use the charts within the report to compare their profit performance with other firms in the same sector.

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1. INTRODUCTION

Productivity in the construction industry is among the lowest of all industrial sectors. Also construction productivity appears to be slowly declining, whereas in most industries productivity is improving, or at worst, is flat. This report examines sub-sectors of the construction industry to identify which have the best and worst performance. The aim is to identify how the various sectors of the industry compare.

This report uses firm level data aggregated into groups, including profit margins and labour productivity, which shows the spread in performance between groups of firms for each sub-sector.

The data is sourced from Statistics New Zealand (SNZ) and includes their business survey results and tax data. They have added firm data into value bands to preserve confidentiality.

Earlier work by others (Fabling et al 2008) has suggested a fairly wide distribution in productivity in the construction industry as a whole. They did not investigate at the sub-industry level. This research investigates how performance varies between sub-industries, and between firms in the same sub-industry. The analysis shows sub-industry performance for a number of parameters including labour productivity and profits to turnover ratios. Individual owners can use these to compare with their own outcome for the year.

2. SUMMARY

There was a wide variation found between the construction sub-industries for profit margins and labour productivity for the 2008/09 financial year. Average taxable profits as a percentage of sales varied between sub-industries from 16% to 45%. Labour productivity varied between $104,000 and $48,000 per person.

The higher profit margins were found in the structural steel erection, carpentry and painting/decorating sectors. The higher labour productivity was found in the plant-intensive sectors including road and bridge construction, site preparation services and non-residential buildings.

Within sub-industries there was a very wide spread in profit and productivity ratios. Typically about 18% of firms in a sub-industry had a profit percentage twice that of the sub-industry average, and about 10% of firms had labour productivity twice the average of other firms in the same sub-industry.

The data presented in this report is a snapshot for a particular period. Comparisons between sub-industries help indicate which sectors may be under-performing, but often there are good reasons why values differ, as discussed later. The relative performance between sub-industries may change from time-to-time, but trend data was not examined in this project due to resource constraints.

The main use of this report for firms is they can compare their profit performance with other firms in their sector for the 2008/09 year. Distribution charts are provided which show the percentage of firms within each profit band, and owners can use these charts to assess their relative performance compared to similar firms.

3. PRODUCTIVITY TRENDS

Productivity is officially measured as value-added divided by labour inputs, or a mix of labour and capital inputs. It is a measure of outputs divided by inputs. Value-added is

mainly profits plus wages and salaries. It reflects the market value of skills in wages/salaries, and demand conditions in profit margins. Figure 1 shows value-added per person employed, using constant 1995/96 dollars. Construction is among the lowest of all industries by this measure. The closest industry in structure to construction is manufacturing and the chart indicates this sector has about twice the labour productivity of construction. Mining and EGW (electricity, gas and water) are capital-intensive rather than labour-intensive, so they have high labour productivity.

Figure 2 and Figure 3 show the SNZ official measure of productivity trends as an index. The base index is 1000 in 1978 and the charts show relative performance of the various industries since then. Again, by these measures construction performance is poor.

Figure 2 is a labour productivity index which allows for overtime hours which Figure 1 has not included, and is a more accurate measure of trends than value-added per labour number. Figure 3 is a multi-factor productivity index which allows for labour and capital inputs. It is measuring the change in output not attributable to these inputs i.e. it measures the contribution of technology, advances in knowledge, improvements in management, or production techniques towards output growth.

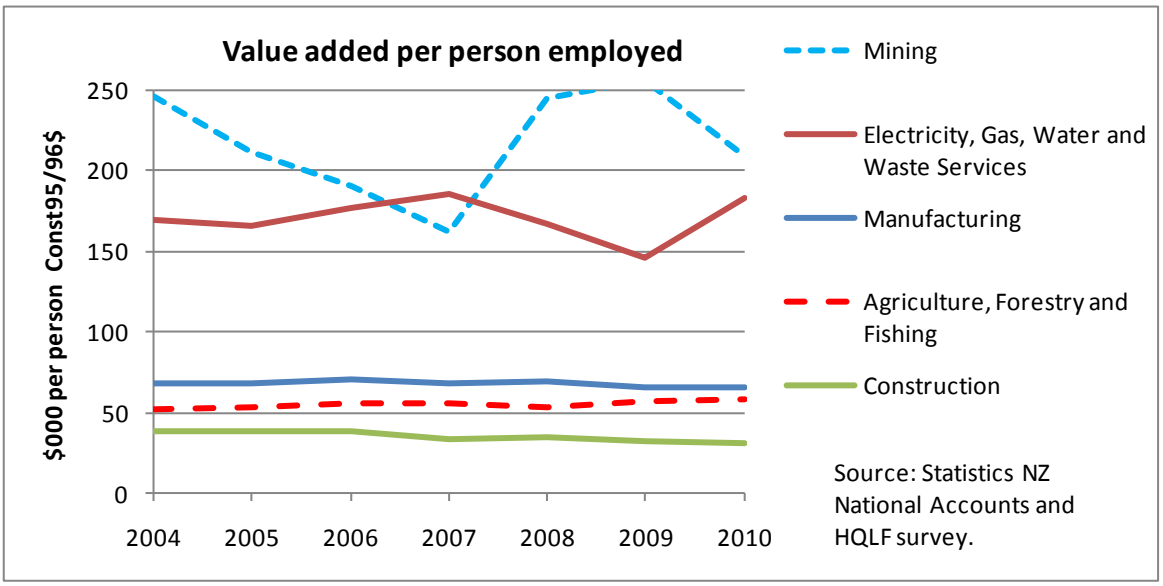

Figure 1. Value-added per person employed

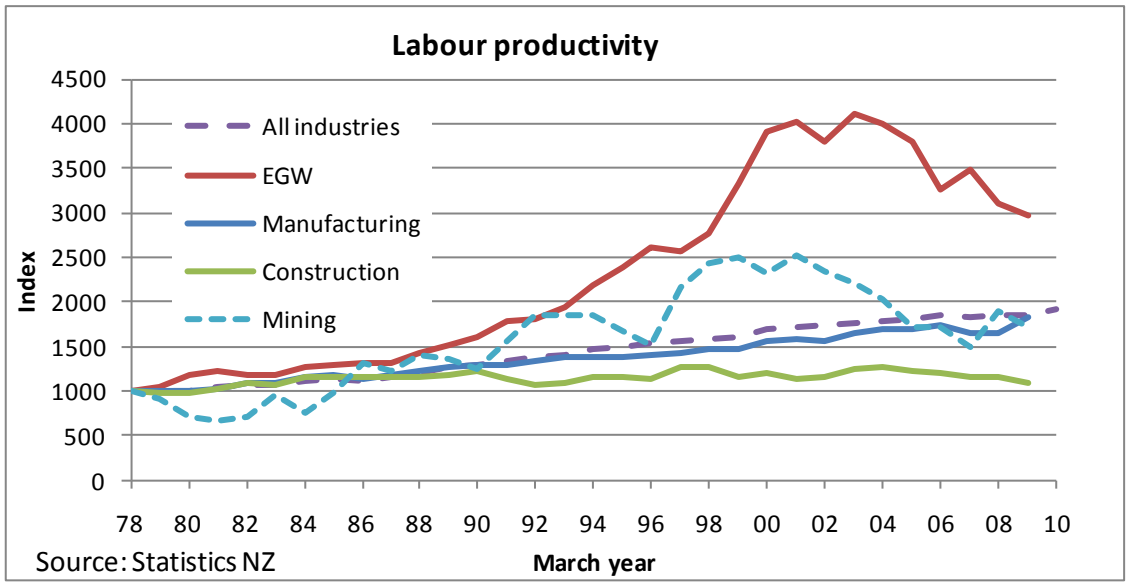

Figure 2. Labour productivity trends by selected industries

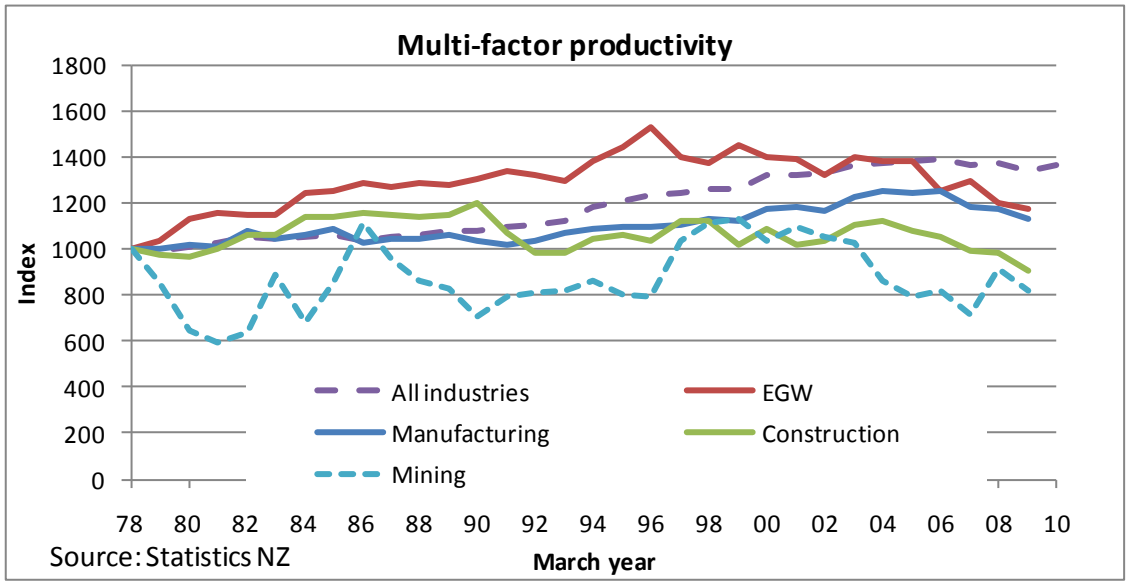

Figure 3. Multi-factor productivity trends by selected industries

The rest of this report examines the construction industry at a sub-industry and firm level. As mentioned above the aim is to identify whether some sectors are performing better than others. Also the profit ratio and productivity distribution profiles provide an demonstration of the variability between firms.

4. METHOD

Data was obtained from SNZ on Sales, Taxable Profits, Ratio of Taxable Profits and Sales, and the Gross Profit per Employee for 2009 based on Inland Revenue Department (IRD) tax returns. This data was aggregated into value ranges to preserve confidentiality by SNZ. The 2008/09 years were the most recent available from SNZ in which tax data had been processed.

The two main measures of performance presented here are taxable profits per $ sales, and value-added per person engaged. The first metric is probably of the most interest to business owners because it enables comparisons between firm performance and the total sub-industry. The second metric, value-added per person, is a productivity type measure and helps identify which segments perform better than others.

The gross profit per person engaged has been used as a proxy for labour productivity. Gross profit is sales less purchases plus changes in stock and is approximately equal to value-added. Persons engaged include working proprietors, as well as employees.

SNZ also carries out a Business Operations Survey. Data from this for the 2009 year was used to provide information on the construction industry's operations practices and compare it to all industries.

5. MAIN RESULTS

5.1 Taxable profit and sales ratio

The measure of most interest to individual owners is how their firm performs compared to industry averages, especially in terms of profits. The actual profit varies with the size of the business so it was decided to show profits as a percentage of turnover or sales. The results for all sectors are shown in Figure 4 for the various sub-industries. The data is for the year ending March 2009, which was the latest data SNZ was able to provide at a sub-industry level.

The highest profit ratios where achieved in the Structural Steel Erection Services and in Carpentry Services. Lower margins occurred in Civil Engineering (Road and Bridge, Other Heavy) and Site Preparation Services, which are plant-intensive sub-industries having large depreciation expenses.

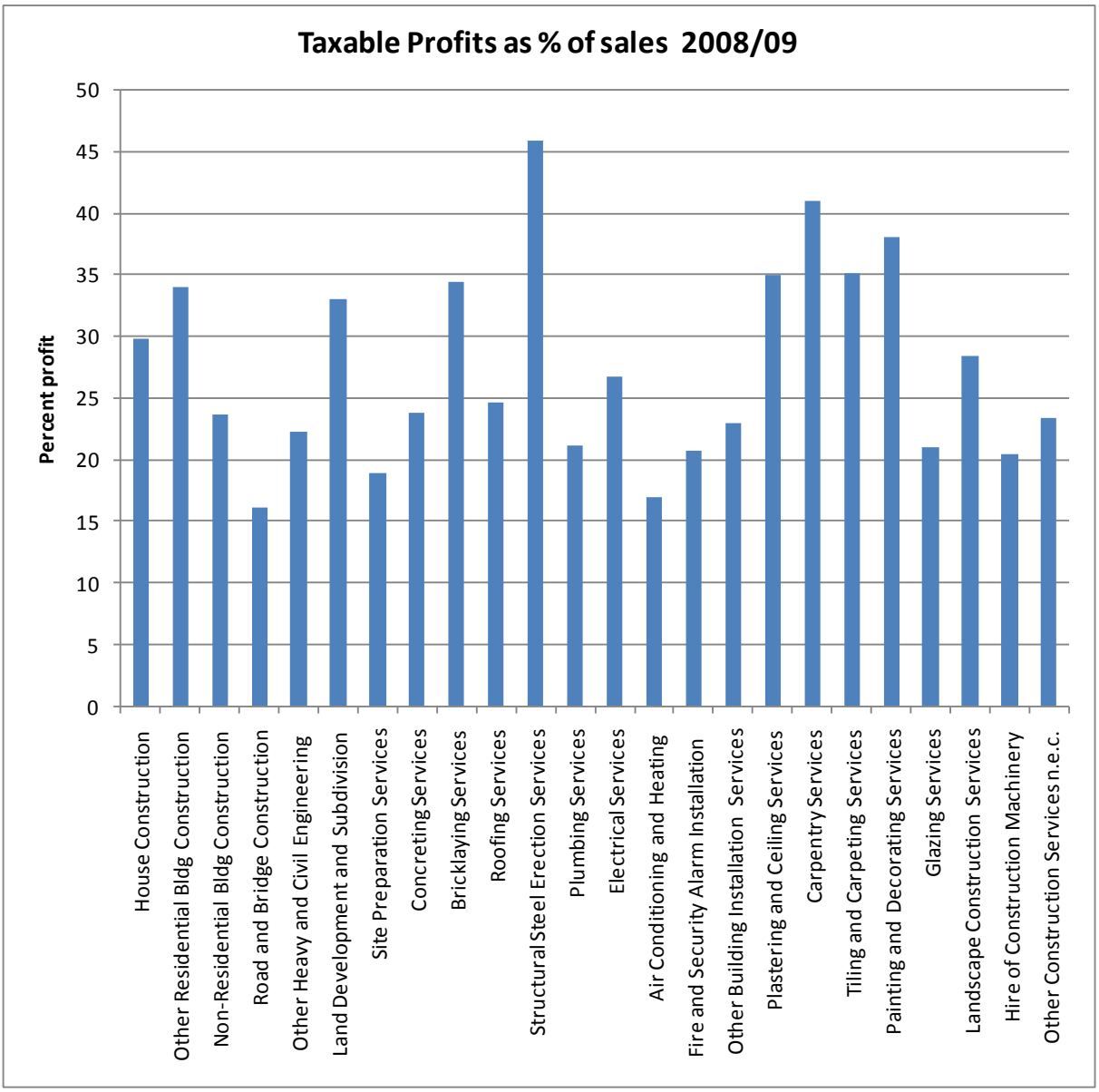

Figure 4. Profits by industry sub-sector

The next four charts show the distribution of profit margins in the main sectors of the industry. These are:

- Residential i.e. House Construction and Other Residential Buildings
- Non-residential Buildings
- Civil Engineering i.e. Road and Bridge Construction, and Other Heavy and Civil Engineering
- Construction Services, i.e. all the sub-contractors after Other Heavy and Civil Engineering in Figure 4.

The distributions are the percentage of firms in the profit margin range, as recorded in the SNZ tax database. They total about 39,000 firms, which is a good proportion of the total number of enterprises in the industry of about 53,000 as found in the 2009 Demographic Business Survey for the industry. Some firms are missing from the tax database and some have regional enterprises which are amalgamated. However it is

believed the profit distributions in the charts are representative of the whole industry. The four main sectors – Residential, Non-residential Buildings, Other Construction, and Sub-contractors – are shown below in Figure 5 to Figure 8.

Note that the average profit percentage on the charts is calculated ignoring the zero and negative profit firms. These are believed to be mainly inactive firms or firms that did not provide reliable data on wages/salaries and profits.

The charts show the distribution of profit margins by percentage of firms. The surprising feature is the large range in profit margins recorded.

The residential and sub-contractors sectors had the larger average profit margins, with about half of all firms having profits over 25%. These two sectors are notable for the number of firms at the high profit end of the distribution, with approximately 12% of these firms having margins over 70%. It is speculated that these are mainly one or two person firms where the owners pay themselves minimal wages and most of the surplus appears as profits.

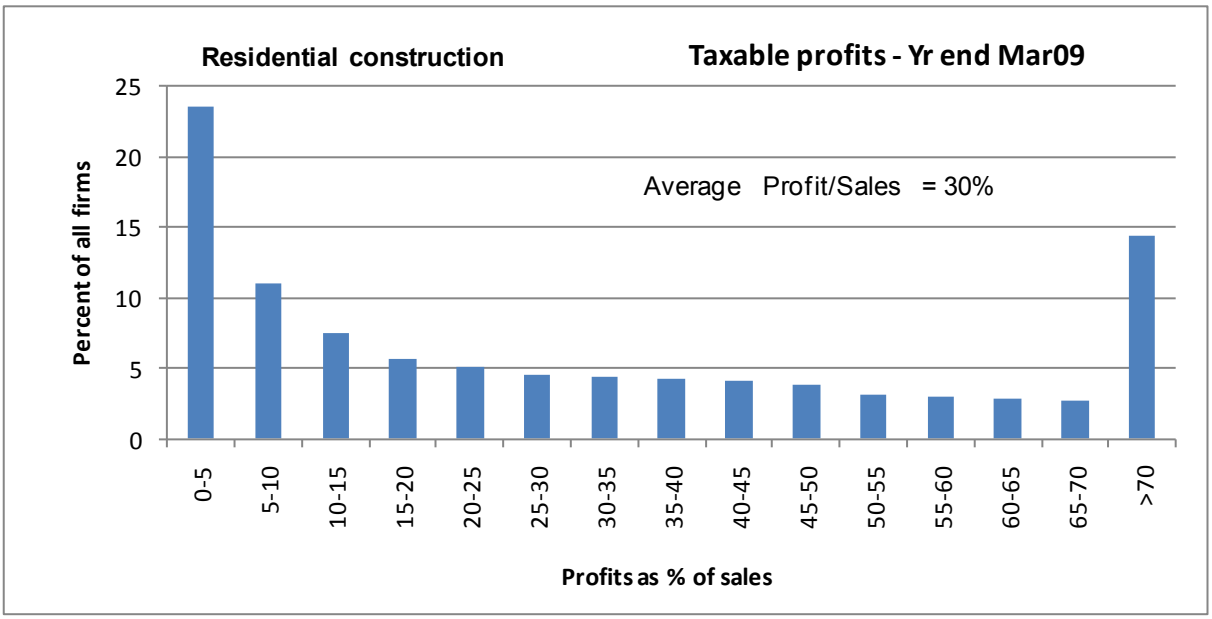

Figure 5. Ratio of taxable profit and sales in the Residential Building sector 2009

The Non-residential Building and the Other Construction sectors had lower average profits than Residential and Services, and quite a high proportion (about half of all firms) had margins below 10%, possibly due to significant depreciation expenses.

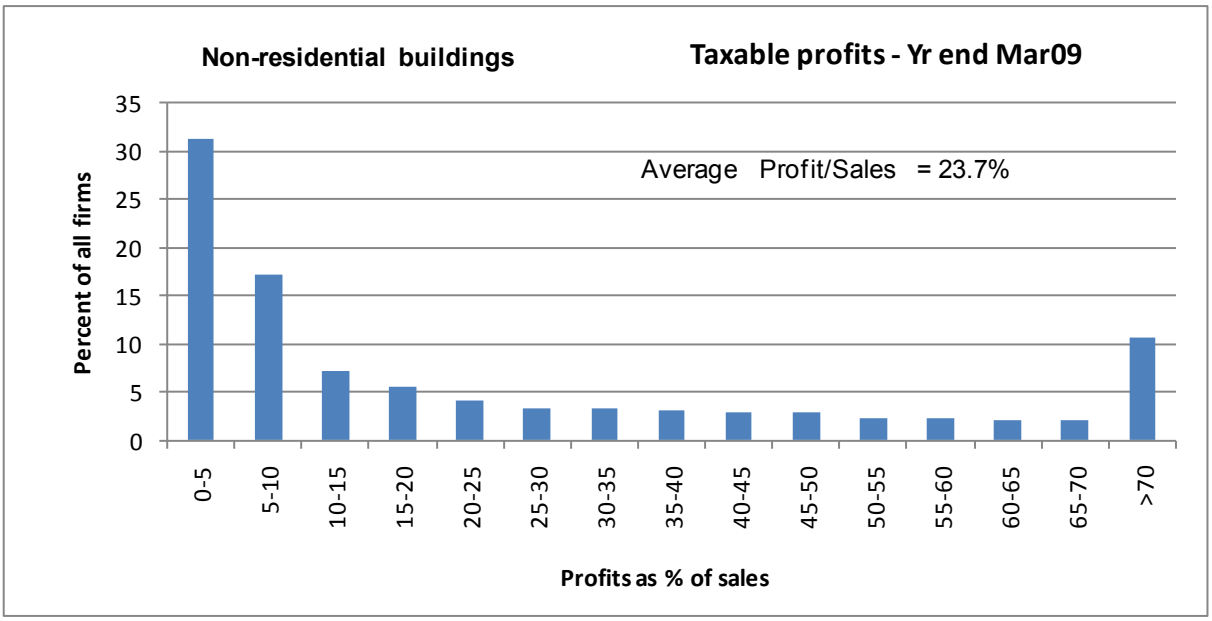

Figure 6. Ratio of taxable profit and sales in the Non-residential Buildings sector 2009

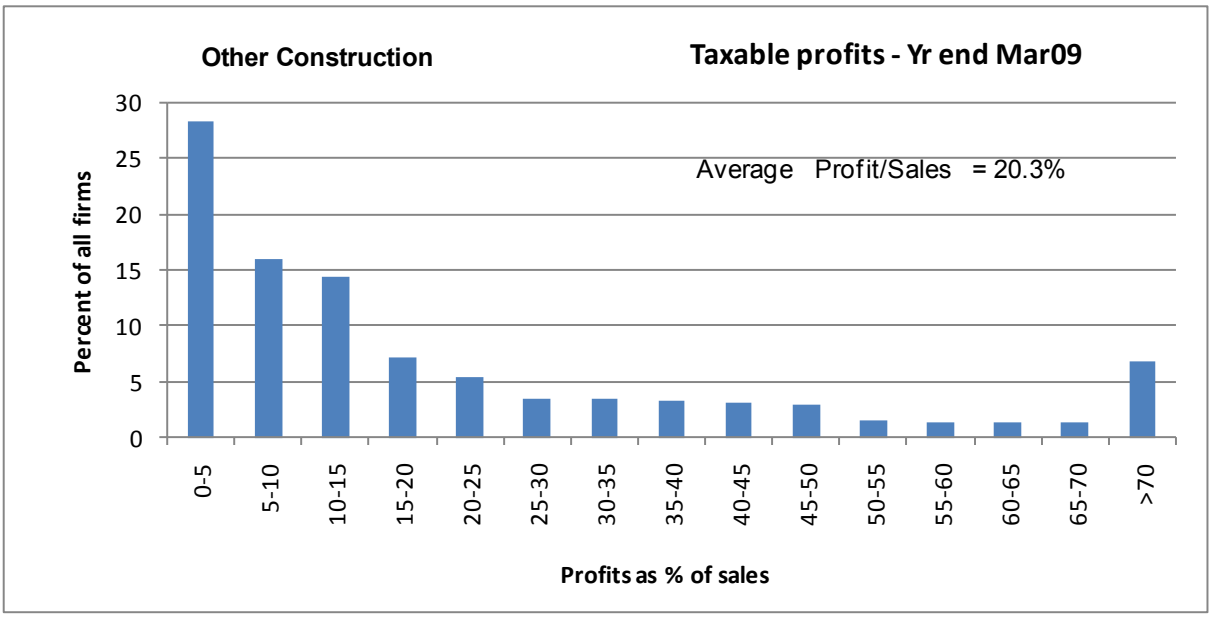

Figure 7. Ratio of taxable profit and sales in the Other Construction sector 2009

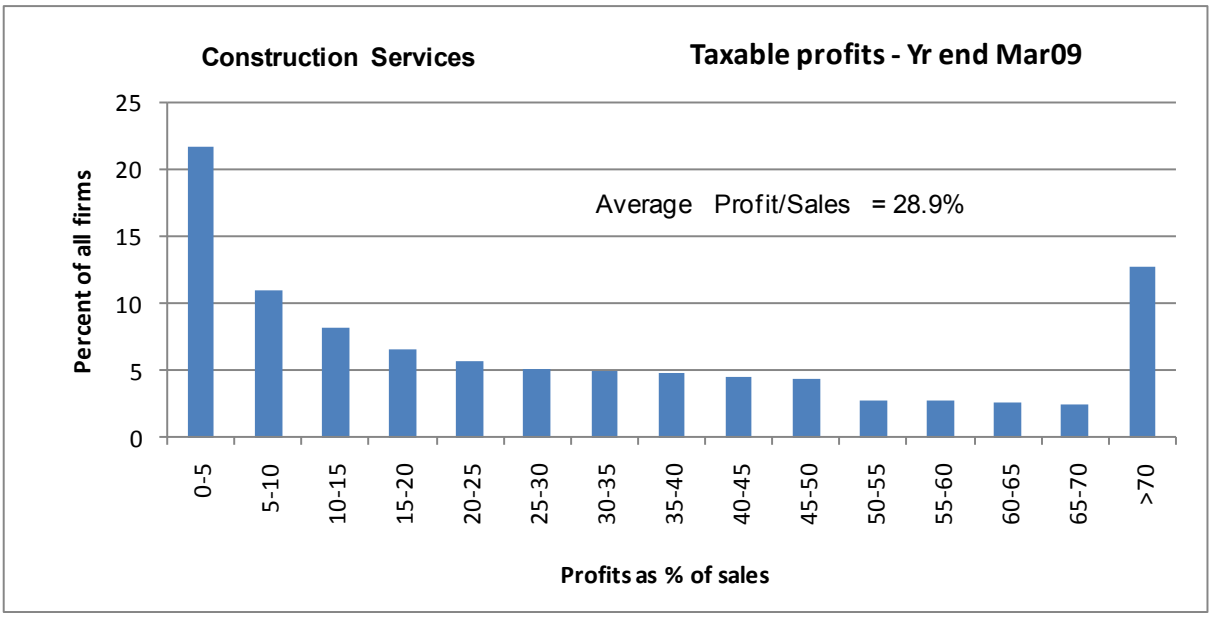

Figure 8. Ratio of taxable profit and sales in the Sub-contractor sector 2009

While the Construction Services sector as a whole has quite high average profits, examination of Figure 4 shows the average profits ranged between 46% for Structural Steel Erection, down to 17% for Air Conditioning/Heating Services. Individual firms can "benchmark" their performance against the whole sub-industry. The detailed distributions are provided in the appendix.

5.2 Productivity

Productivity is an important measure because it enables trends in industry performance compared to other sectors to be consistently monitored over time. In contrast, profit margins vary depending on market conditions and may not reflect the contribution of the industry to the economy.

Variations in productivity between construction sectors are quite wide (see Figure 9). The chart indicates a range of between $104,000 value-added per person down to $48,000 per person employed. The higher values are for plant and machinery-intensive sectors such as Road Construction. Some of the lower values are in lower skilled sectors such as Painting/Decorating, Bricklaying, and Plastering/Ceiling Services. It is notable that the latter sub-industry had low labour productivity but high profit margins. Bricklaying and Painting/Decorating had a similar outcome. These results are believed to arise because these three sub-industries are labour-intensive and poorly paid but appear to have high profits for the firm owners.

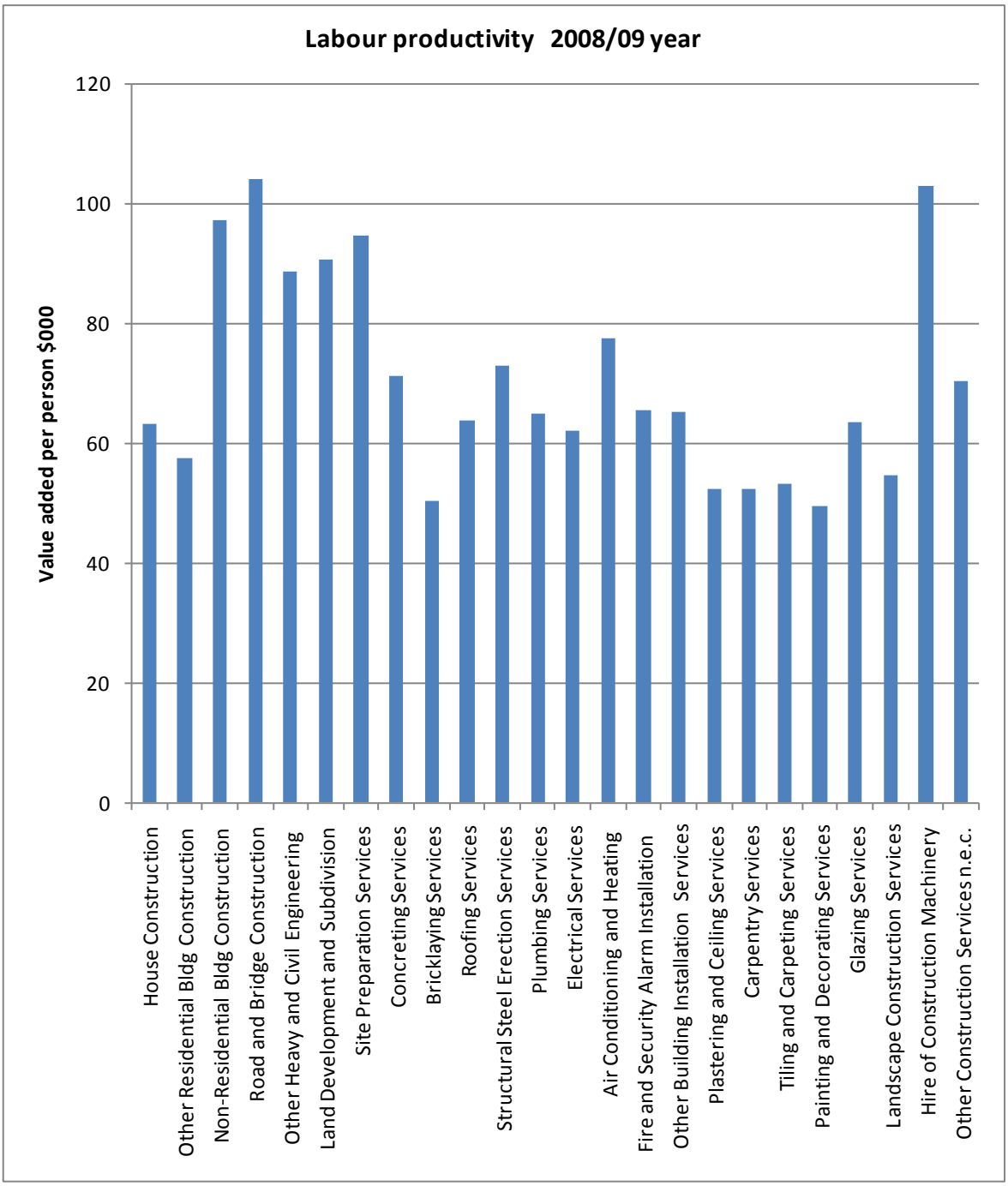

Figure 9. Labour productivity by industry sub-sector

Note, as before, the average labour productivity on the charts is calculated ignoring the zero and negative return firms.

Figure 10. Labour productivity in the Residential sector 2009

Figure 10 shows the Residential sector distribution. The peak is in the $40-50,000 per person range but there is a long tail, continuing well past the $150,000 band.

Figure 11 has the Non-residential Building distributions. It is flatter than for the Residential sector and its average is higher. Due to the comparatively large $150,000+ category, the average value-added per employee of $97,300 is approximate. We have calculated an average of $223,000 per person for the $150,000 and up group.

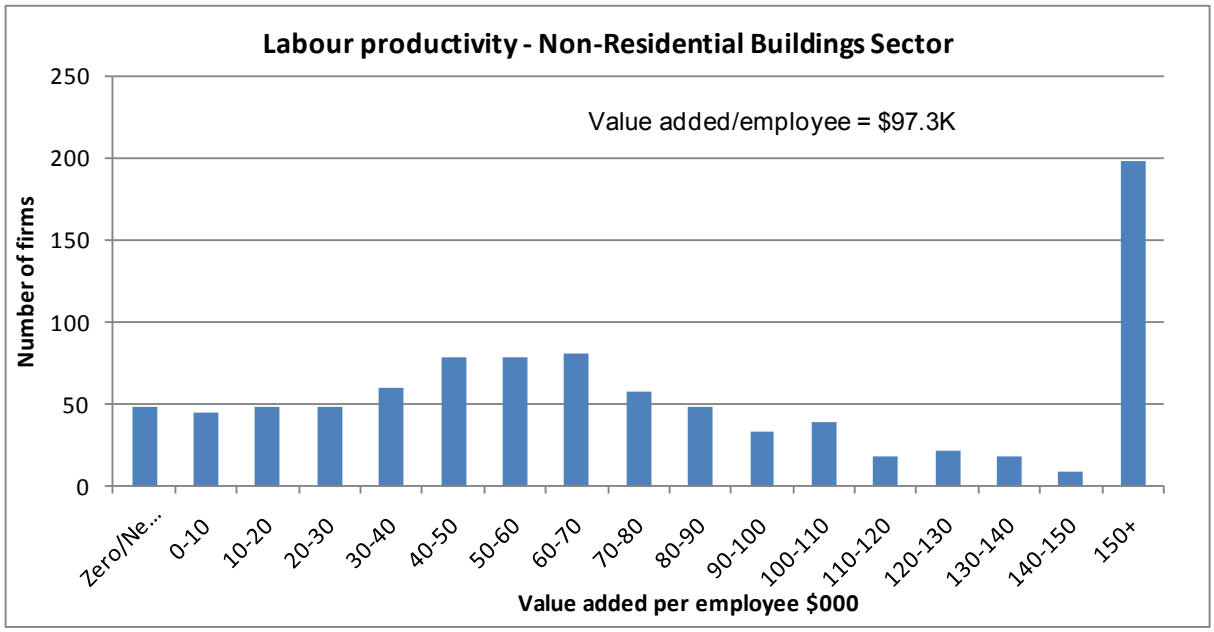

Figure 11. Labour productivity in the Non-residential Buildings sector 2009

Below is the chart relating to the productivity of the Civil Engineering sector. Much like the Non-residential sector, the Other Construction sector has a comparatively large $150,000+ band, and an average of $173,000 was derived for this upper segment.

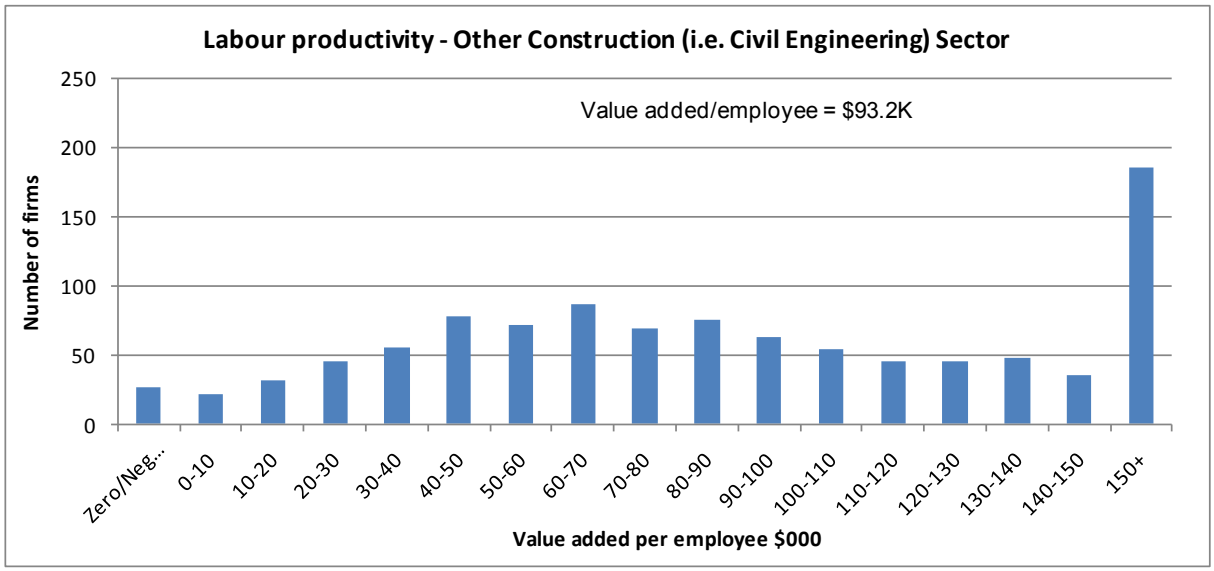

Figure 12. Labour productivity in the Other Construction sector 2009

The final group (Figure 13) is for all the sub-contracting sectors, and has the lowest value-added per person of the four broad groups. However there is a quite wide range of average value-added per person among sub-contractors, as shown in Figure 9. The appendix has the distributions for individual sub-industries. Leading the way in the sub-industries are the Site Preparation Services and Hire of Construction Machinery with Operator industries, at over $90,000 value-added per person. They are capital-intensive sub-industries, where heavy machinery is important.

Bricklaying Services and Painting and Decorating Services are the least productive sub-industries with values added per worker of approximately $50,000. They are labour-intensive sub-industries, typically offering very little differentiation between firms, and the sector has a fairly concentrated distribution with short distribution tails. See the appendix for each sub-industry distribution chart.

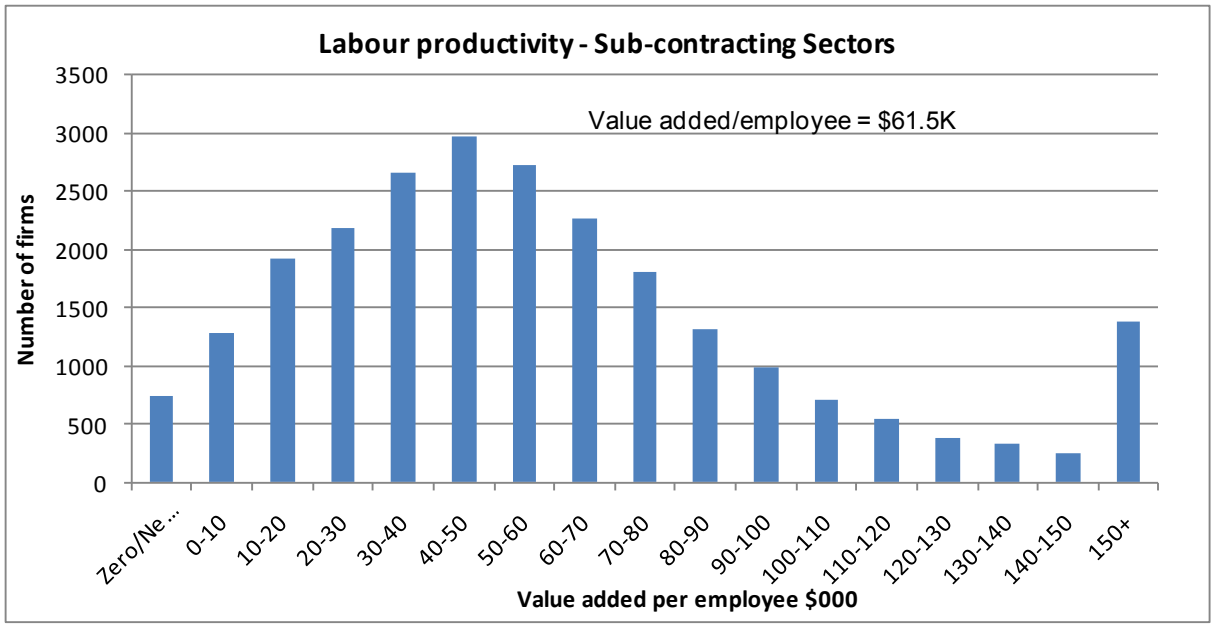

Figure 13. Labour productivity in the Sub-contracting sector 2009

In summary, the most productive of the construction sectors is the Non-residential Buildings sector; on average the value-added per worker is approximately $97,000. The next highest in terms of value-added per worker was the Other Construction sector at $93,000.

The least productive of these sectors was the Sub-contracting sector. Our estimates showed the value-added per worker was $62,000, less than two-thirds of that of the Non-residential Buildings sector.

5.3 Business operations practices

5.3.1 Business operations practices data

The following data was derived from the Business Operations Survey 2009. The available data was only at the two-digit level i.e. Buildings, Civil Engineering and Construction Services. It would have been preferable to have data at a more detailed sub-industry level so that comparison could be done with the sub-industry productivity data in the appendix. However, confidentiality issues precluded more detailed breakdowns.

The measures that we have for the business operations practices data are:

- Skills
- Self-reported productivity
- Profitability
- Delivery performance
- Innovation
- Measuring customer satisfaction
- Working with suppliers.

These measures are shown for three construction sectors, namely: Buildings (residential and non-residential combined), Civil Engineering, and Construction Services (i.e. sub-contractors). For comparison the All Industries (i.e. agriculture, manufacturing, energy, finance, business services etc) results are also shown.

The first chart below shows the distribution of the workforce by their skills. It indicates the construction industry has a smaller percentage of the workforce than All Industry i.e. managers, technicians or other. However, the industry has a much higher percentage than All Industry i.e. tradespersons.

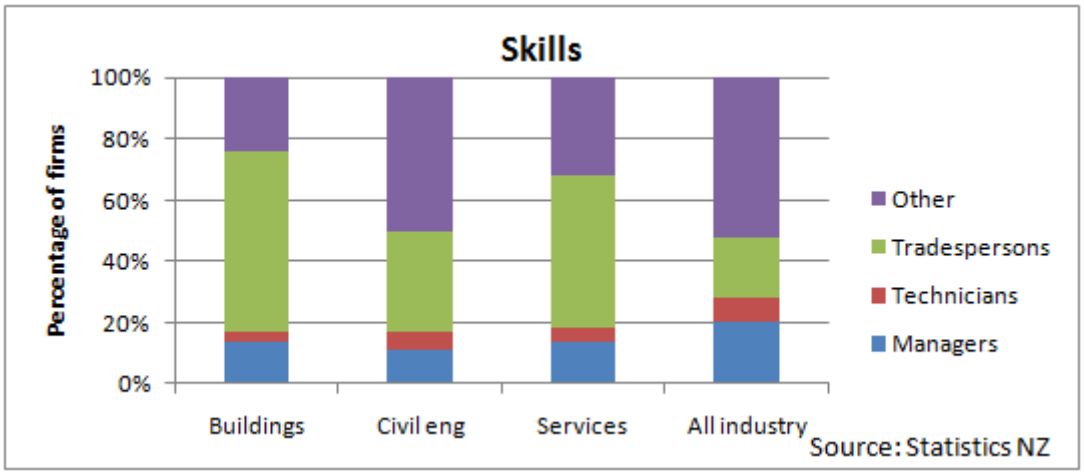

Figure 14. Business operations practices – skills 2009

Buildings, and Construction Services, both had a smaller percentage of self-reported productivity increasing than All Industry (see Figure 15) and both have a higher decrease in self-reported productivity than All Industry. Civil Engineering shows a near zero productivity decrease and a much larger percentage in productivity increase compared to the other sectors.

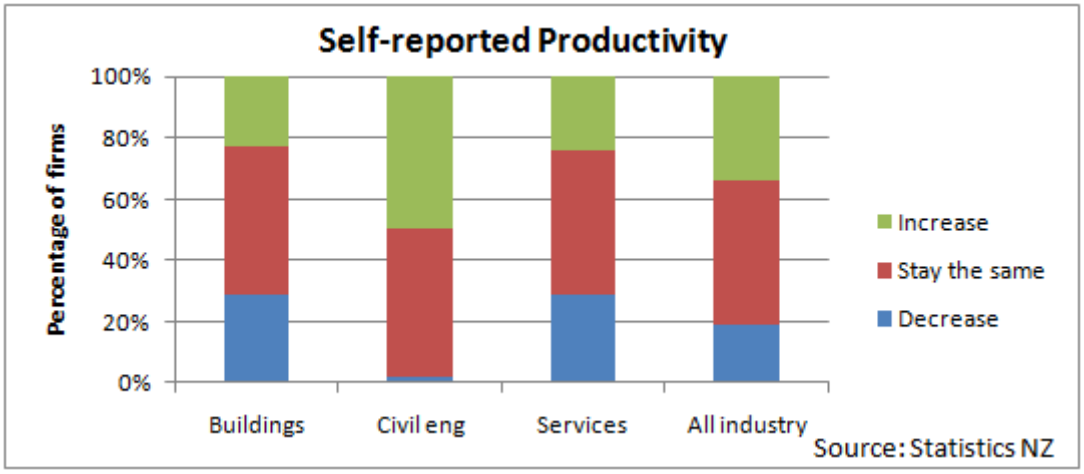

Figure 15. Business operations practices – self-reported profitability 2009

The largest increase in profitability was in Buildings (see Figure 16). The Services sector performed relatively poorly in profitability trends, possibly because the main contractors were better placed to reap the profits of a quite high demand period in 2008/09 at the expense of their sub-contractors.

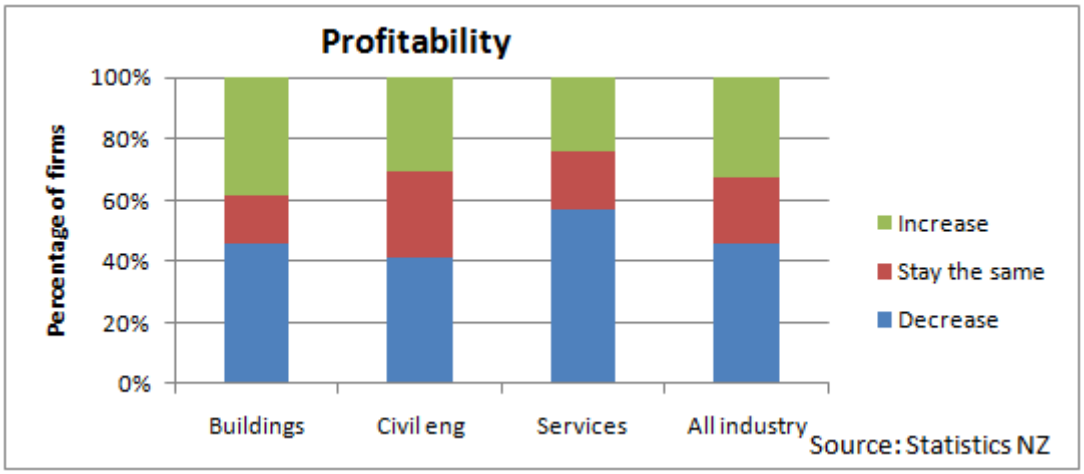

Figure 16. Business operations practices – profitability 2009

Building Construction has a significant proportion of firms at either extreme of the delivery performance range (see Figure 17). At the bottom end about 10% of its firms deliver on time and in spec on less than half their projects. However, almost 60% of these firms have very good delivery performance. The other two industry sectors, Civil Engineering and Construction Services, perform quite significantly worse than the All Industry averages.

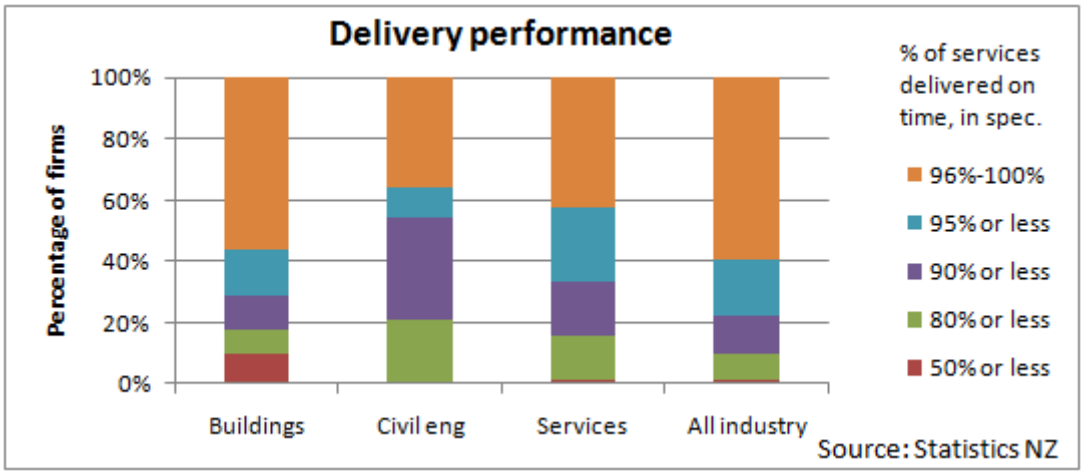

Figure 17. Business operations practices – delivery performance 2009

The Civil Engineering sector performs quite well on innovation (see Figure 18), being above average in most aspects of innovation when compared to All Industry. The Buildings sector has a low rating for goods and services innovation, probably reflecting the high use of “standardised design” and standard construction methods in most firms.

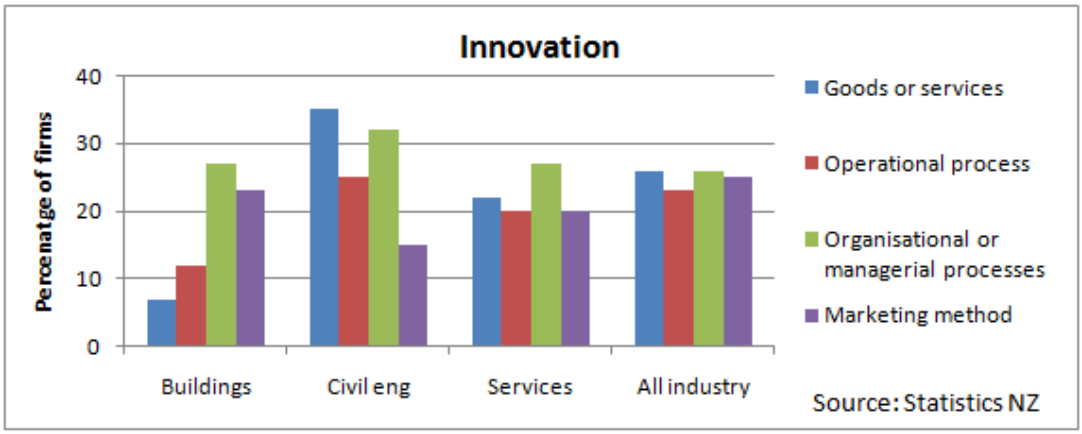

Figure 18. Business operations practices – innovation 2009

It is uncertain how firms measure customer satisfaction in the construction sector. A small number of contractors do measure customer satisfaction as part of the KPI process. However their numbers are very small compared to total firms engaged in the industry. Usually there is a hand-over procedure at the end of a project where aspects of quality and specification compliance are checked. Respondents may be reporting on this process and assuming project completion acceptance is the same as customer satisfaction. This may be reflected in the high "more than twice a year" response across all industry sectors (see Figure 19).

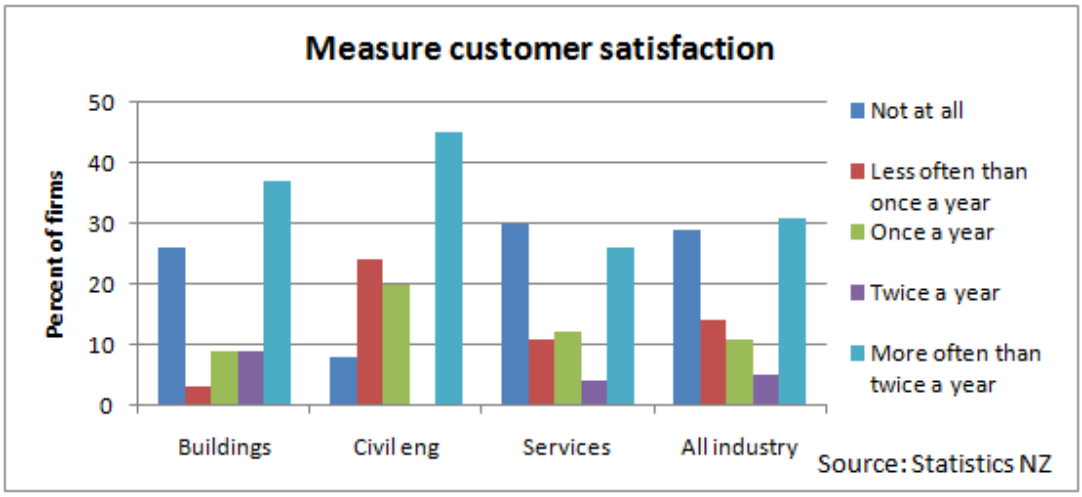

Figure 19. Business operations practices – measure customer satisfaction 2009

Civil Engineering has the highest proportion of working with suppliers, with only 2% not working with suppliers at all (see Figure 20). The industry as a whole works more closely with suppliers than the All Industries average.

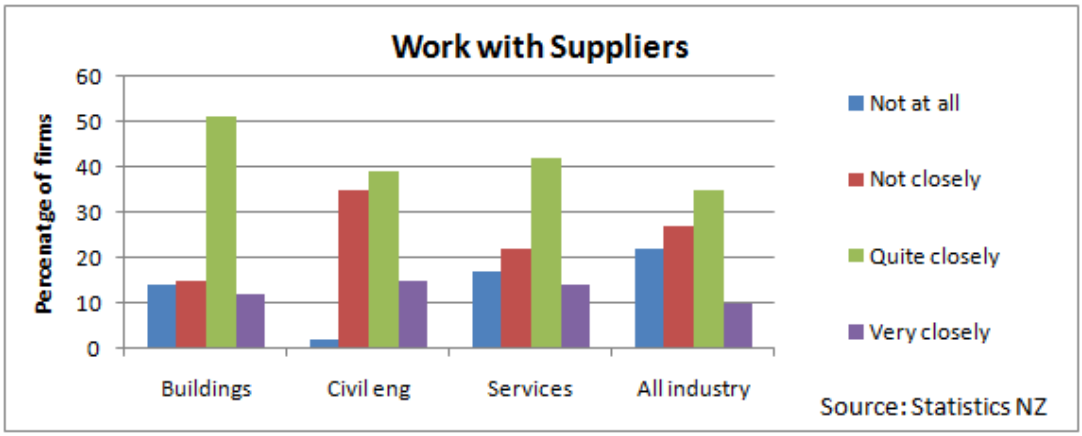

Figure 20. Business operations practices – work with suppliers 2009

5.4 Operations practice data and productivity

Is there any correspondence between business operations practices and productivity? Intuitively we would expect this to be the case. There is no strong evidence from the aggregated results in the SNZ Business Operations Survey 2009 linking good practices to better productivity or profit; however there are a few clues. The percentage skills level in construction as a whole is below that for All Industry. Similarly, delivery performance and some innovation measures in Building and Construction Services are below that for All Industry. This deficit could explain partly why construction industry productivity trends lag behind most other industries.

Comparing practices in the three sectors of the survey (Buildings, Civil Engineering and Construction Services), innovation, measuring customer satisfaction, and working with suppliers are generally higher in Civil Engineering than in Buildings or Construction Services. This aligns with the labour productivity data where Civil Engineering has the highest ratio.

However, it is difficult to draw conclusions from aggregated data because as shown above there is wide variation in performance between firms in the same sub-industry. The analysis would be more valuable if done at a firm level i.e. comparing the labour productivity for a firm with various aspects of its business operations. This proposed firm level analysis may enable the identification of those aspects of business practice which have a significant effect on productivity and profits.

6. DISCUSSION

Which of the sectors of the construction industry are most productive? We have considered labour productivity only, due to the difficulty of establishing a multi-factor productivity measure at the firm level. Examination of Figure 9 shows that the plant-intensive sub-industries have the highest labour productivity. These are Non-residential Buildings, Roading/Bridging, Other Civil, Land Development, Site Preparation, and Hire of Machinery, at over $80,000 value-added per person.

Next is a middle band in Figure 9 of skilled trade groups including House Construction, Concreting (also includes a significant plant component), Roofers, Structural Steel, Plumbing, Electrical, Air Conditioning, Fire/Security Systems and Glazing. They average between $60,000-$80,000 value-added per person.

The lower band includes a significant proportion of labourers and is generally lower skilled than the other bands. These are Bricklaying, Plastering, Tiling/Flooring, Painting/Decorating and Landscaping, at $50,000 to $55,000 value-added per person.

It is postulated that improved productivity would lead to better profit margins. We have not tested this for individual firms. However Figure 21 shows sub-industry averages in scatter plot with profits versus labour productivity. Each dot represents one sub-industry group. Contrary to expectations the trend is downward instead of upwards i.e. improved labour productivity is associated with declining profit margins. The correlation coefficient is -0.6.

There are two bands of dots in Figure 21, the right diagonal band being the capital-intensive sub-industries. The left band is mainly the Construction Services industries (i.e. the sub-contractors). The higher profit sub-industries in the left diagonal are mainly the lower skilled groups including Painting/Decorating, Tiling, Plastering, Bricklaying and Carpentry Services. It appears that these groups are lowly paid, so while they have good profit margins the total value-added is low because of the low wage component. In contrast the sub-industries at the bottom right of the services band include plumbers, electricians, HVAC and fire alarms installers who are higher skilled and paid more. The profit margins are lower in these groups because more of the operating surplus goes into wages and overall value-added per person is therefore higher.

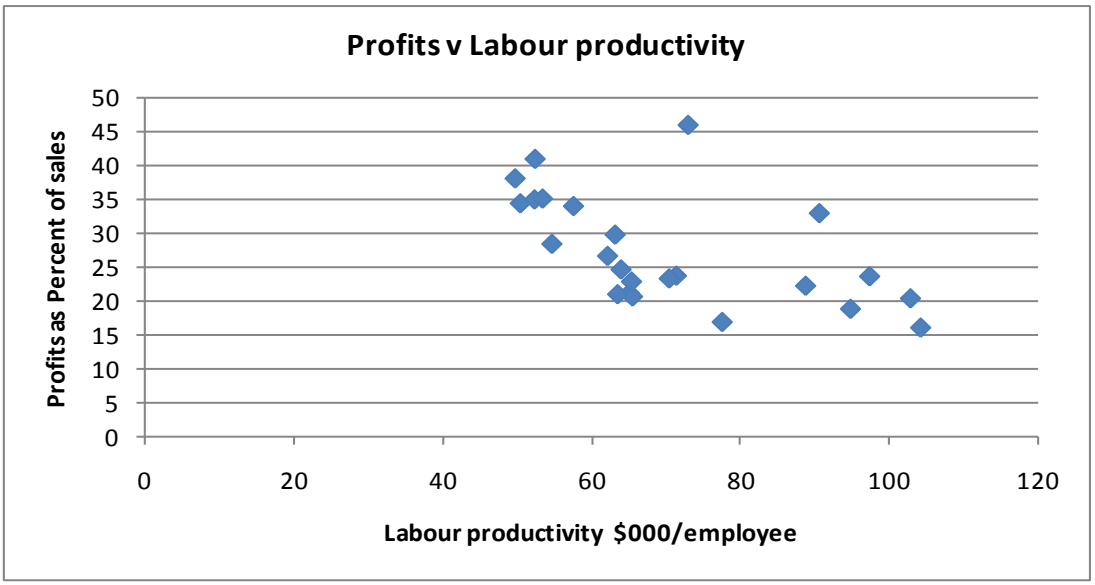

Figure 21. Profits versus productivity by sub-industry

It is likely that if the analysis in Figure 21 was done for all firms in one sub-industry, and where each dot is one firm then the trend would be different. We would expect the trend to be upward to the right i.e. the more profitable firms would be more efficient in use of labour. A mathematical analysis for this is in the appendix, which shows that the trend should be upward under simple assumptions.

Another reason for higher profits in some sub-industries is the firm size. Figure 22 shows the profit margins for various sub-industries against the average number of persons engaged per firm. Each mark is the average profit percentage for the sub-industry, against their average employment number. There is a trend for reducing profit margins as the average firm size increases.

All the analysis has been a cross-section data i.e. for the 2008/09 financial year. It would have been preferable to monitor trends over time within each sub-industry but was not done due to lack of resources.

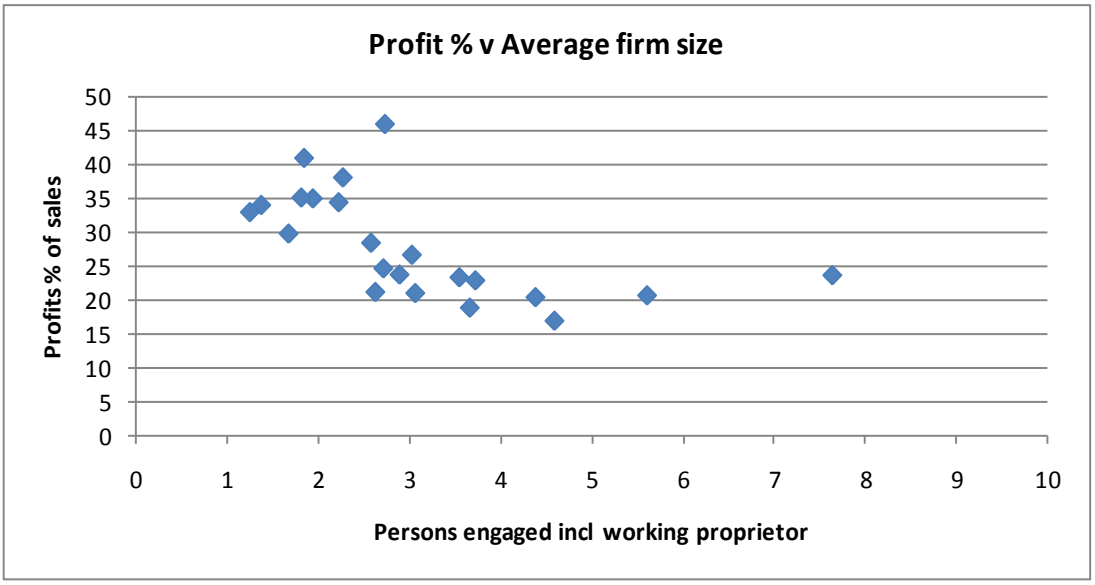

Figure 22. Profits versus average firm size by sub-industry

7. RECOMMENDATIONS

A study should be done on individual firms within each sub-industry to compare their profit ratios with their labour productivity. There is also a need to look more closely at the proportions of operating surplus going to taxable profits and to wages in small firms as it is believed these firms may be over-estimating the profit margins at the end of the distributions.

Access to the SNZ Longitudinal Business Database should be sought to compare firm productivity with various parameters from the Business Operation Survey 2009. The aim is to discover what aspects of firm behaviour, as revealed by the survey, affect productivity. This would initially be a cross-sectional study to investigate the difference between firms. A possible extension to this would be to follow the same firms over a number of surveys to see if changing behaviour affects their productivity. This research could only be done by authorised personnel under strict confidentiality agreements as it accesses individual firm data.

8. REFERENCES

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9. APPENDIX

9.1 Labour productivity and profits

Within an individual firm one measure of labour productivity is given by value-added divided by persons employed. Value-added is approximately equal to profits plus wages and salaries.

LP = (P + N*w)/N

LP = labour productivity

P = profits per year

N= number of persons employed

w = wage rate $/year

Rearrange the above so

P = LP*N – N*w.

Let the total value of sales depend on the number employed i.e.

Sales = c* N where c is a constant

Then profits/sales = P/c*N and substitute for P above

Profits/sales = (LP*N-N*w)/(c*N) = (LP-w)/c

c is a positive constant so profits/sales is positively related to LP i.e. we would expect a scatter plot of individual firms in the same sub-industry of % profits versus labour productivity to be upward sloping.

The main assumptions are:

- The volume of sales depends solely on the number of persons employed.
- Each firm within a sub-industry has the same amount of plant and equipment per worker.

9.2 Profit to sales ratios, and labour productivity, for sub-industries

This section contains details of profits to sales ratios and labour productivity for various sub-industries.

There are 24 sub-industries shown:

- House Construction
- Other Residential Construction
- Non-residential Buildings Construction
- Road and Bridge Construction
- Other Heavy and Civil Engineering Construction

- Land Development and Subdivision
- Site Preparation Services
- Concreting Services
- Bricklaying Services
- Roofing Services
- Structural Steel Erection Services
- Plumbing Services
- Electrical Services
- Air Conditioning and Heating Services
- Fire and Security Alarm Installation Services
- Other Building Installation Services
- Plastering and Ceiling Services
- Carpentry Services
- Tiling and Carpeting Services
- Painting and Decorating Services
- Glazing Services
- Landscape Construction Services
- Hiring of Construction Machinery with Operator
- Other Construction Services not elsewhere classified.

The data was obtained from SNZ using IRD data. Data was supplied in aggregate form and individual firms could not be identified in any way from the data supplied by SNZ.

Most categories are self-explanatory but further details follow. House Construction is for detached housing. Other Residential is multi-units including semi-detached, flats, terraced housing and apartments. There is only one group for Non-residential Buildings provided by SNZ, covering a wide variety of building types.

The Land Development and Subdivision group, and the above groups onward, are aggregated into the Construction Services Group summary charts at the start of this report.

9.2.1 Profits to sales ratios by sub-industry

The charts below show distribution of the profit ratios for each sub-industry. Several sub-industries have a significant proportion of their firms in the plus 70% profit band.

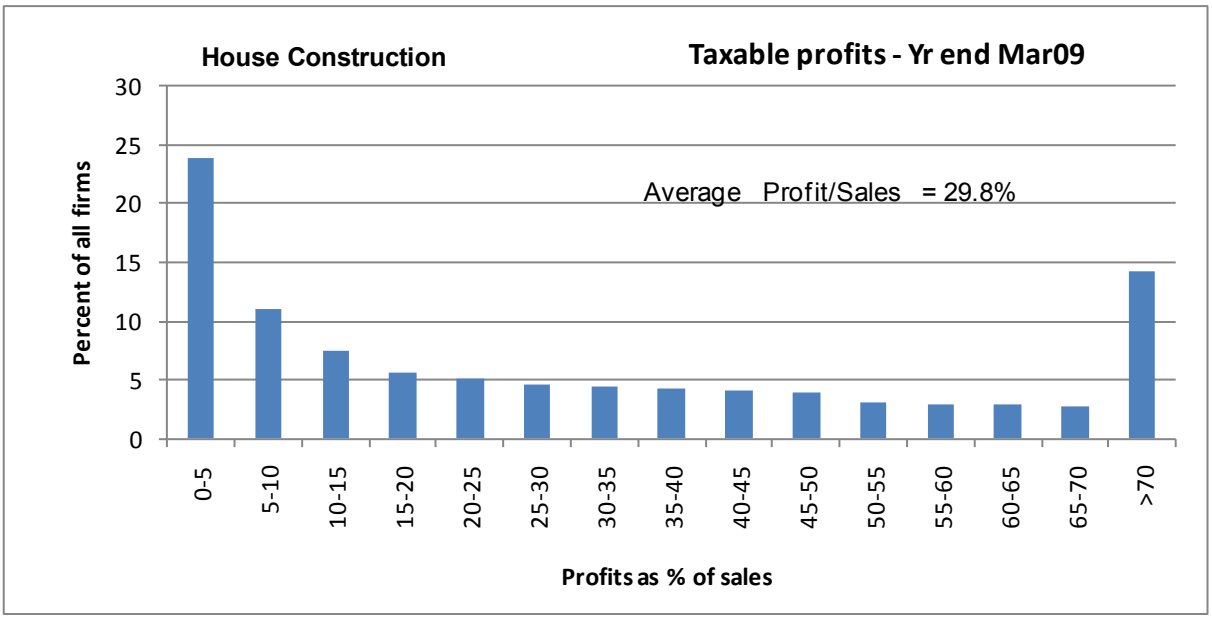


Figure 23. Profits/sales ratio – House Construction

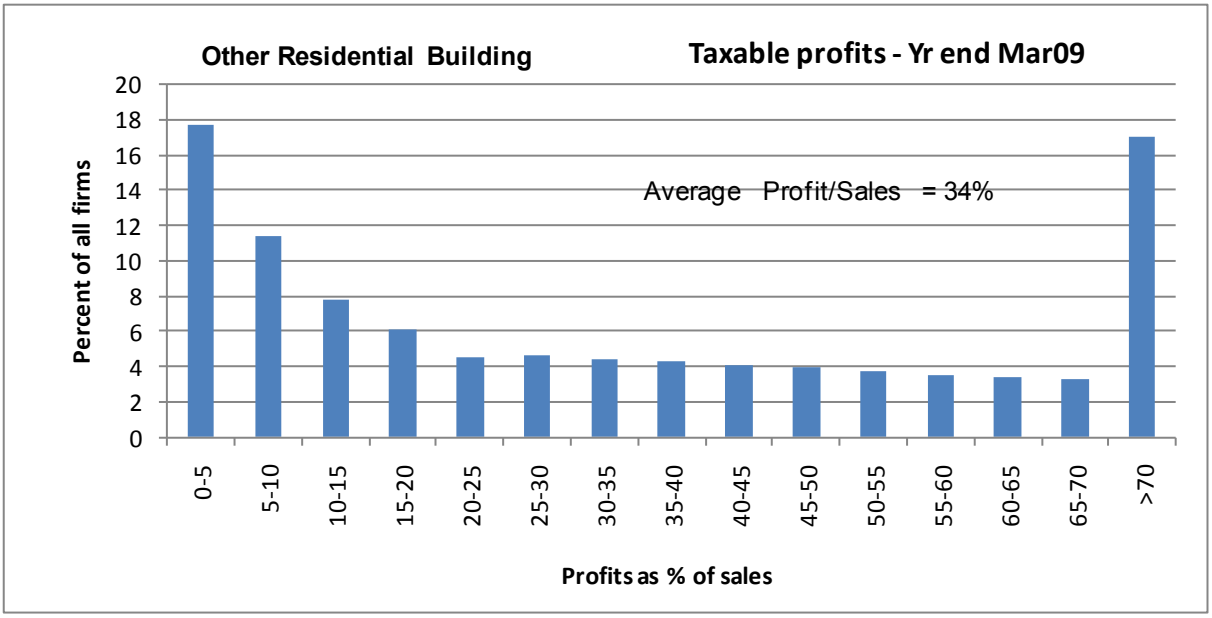


Figure 24. Profits/sales ratio – Other Residential Building

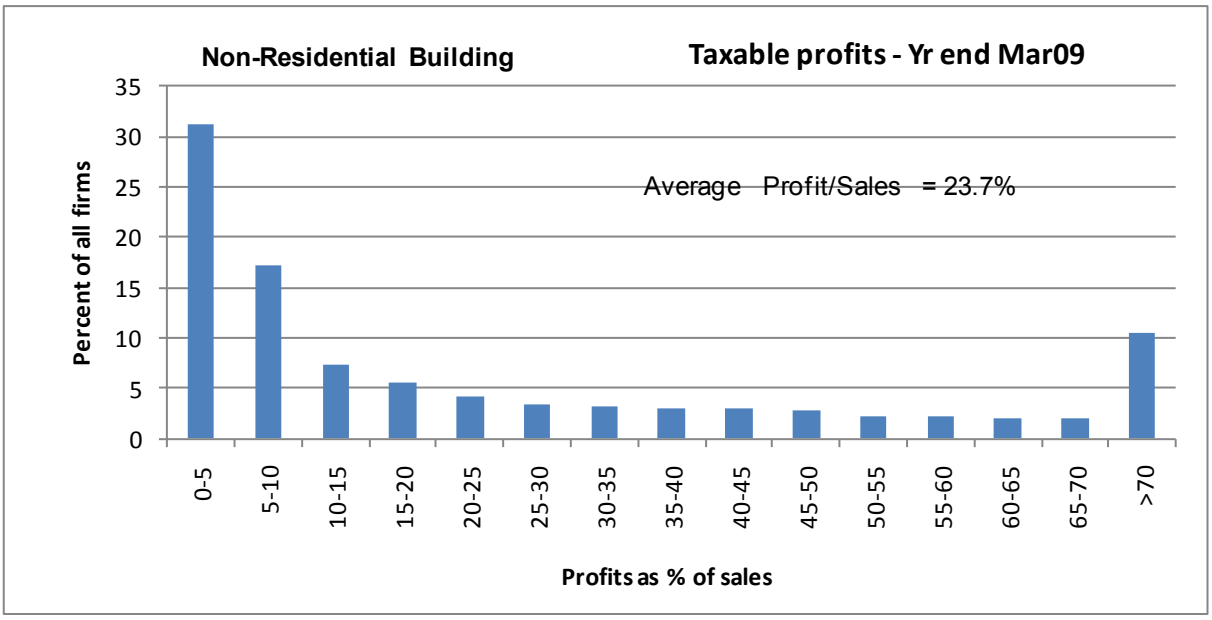


Figure 25. Profits/sales ratio – Non-residential Buildings

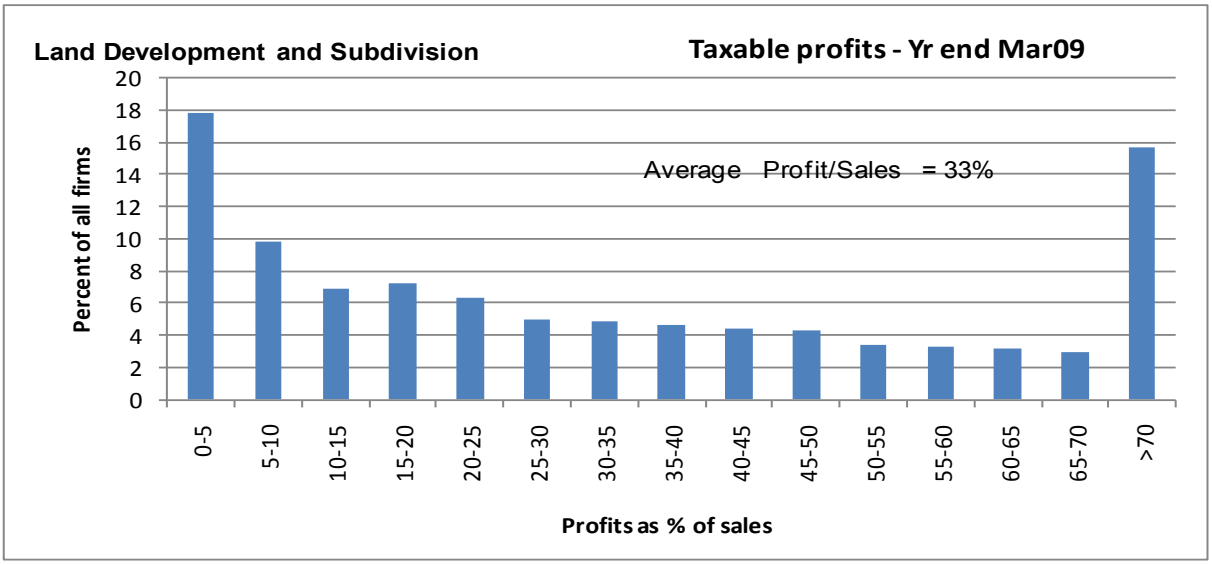


Figure 26. Profits/sales ratio – Land Development and Subdivision

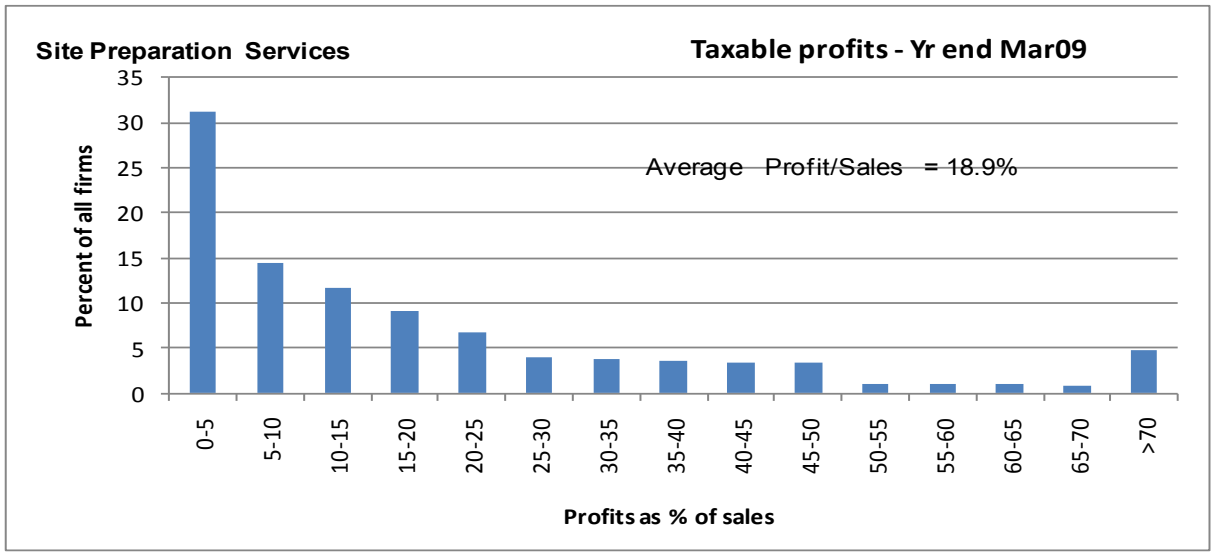


Figure 27. Profits/sales ratio – Site Preparation Services

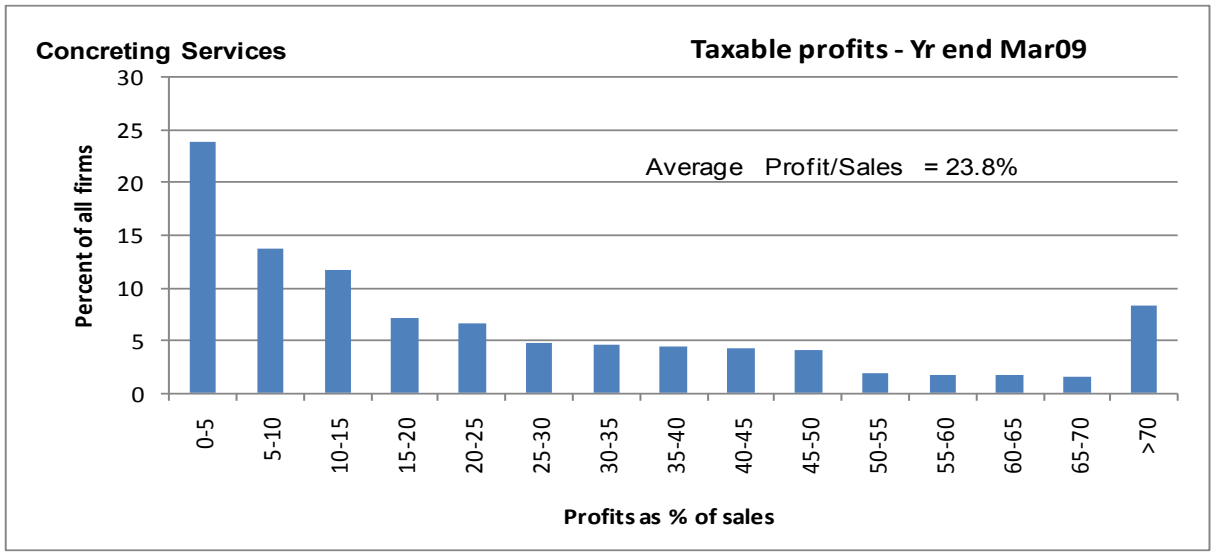


Figure 28. Profits/sales ratio – Concreting Services

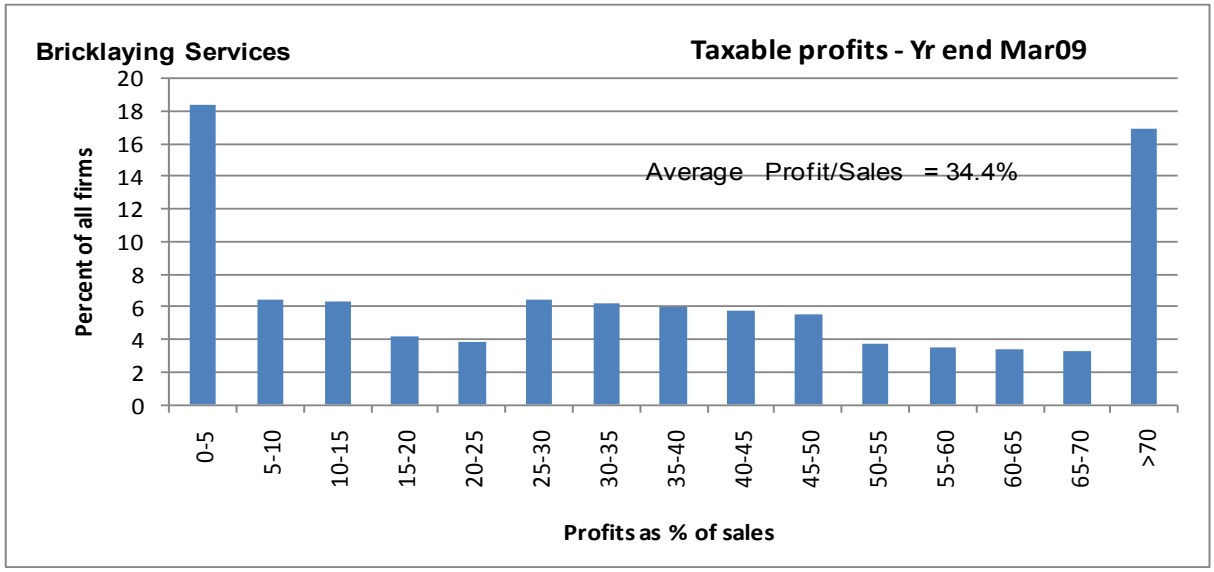


Figure 29. Profits/sales ratio – Bricklaying Services

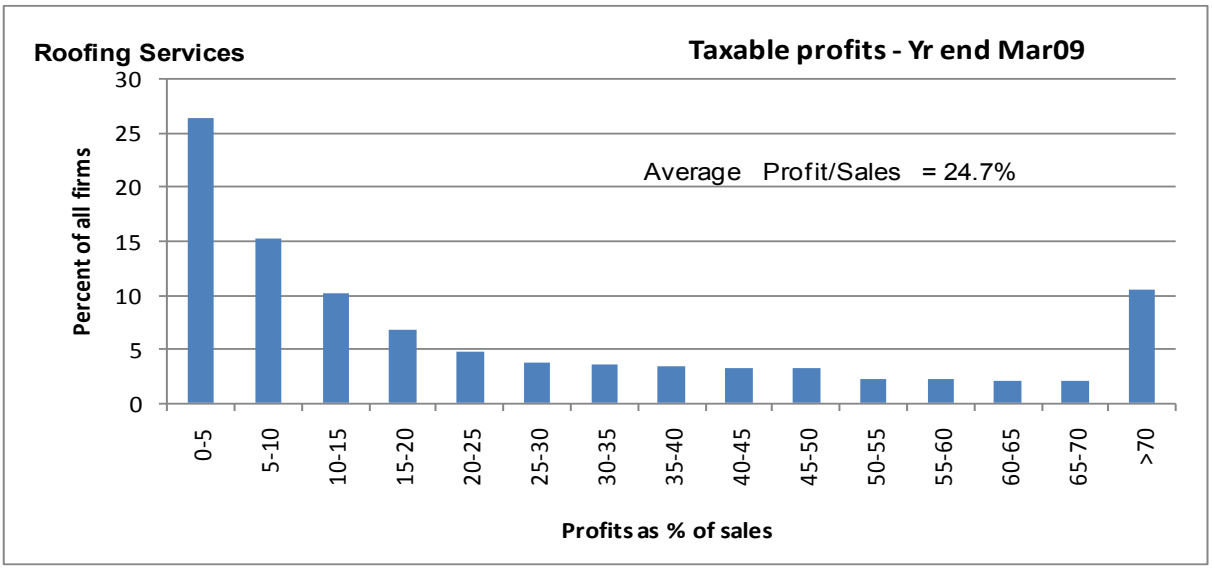


Figure 30. Profits/sales ratio – Roofing Services

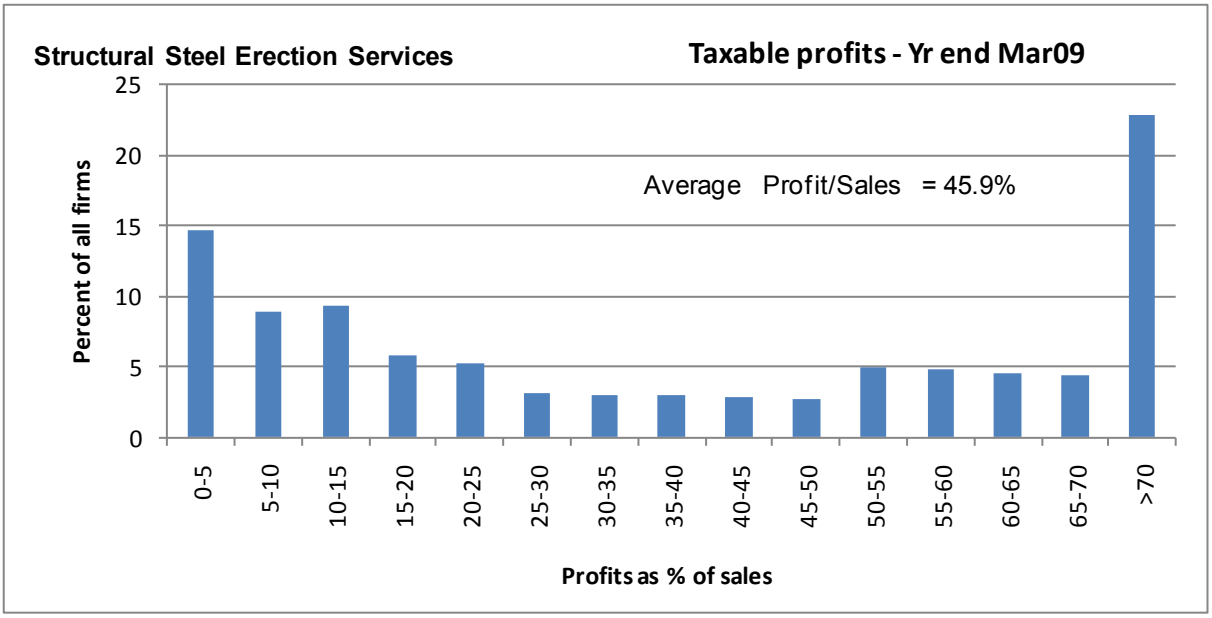


Figure 31. Profits/sales ratio – Structural Steel Erection Services

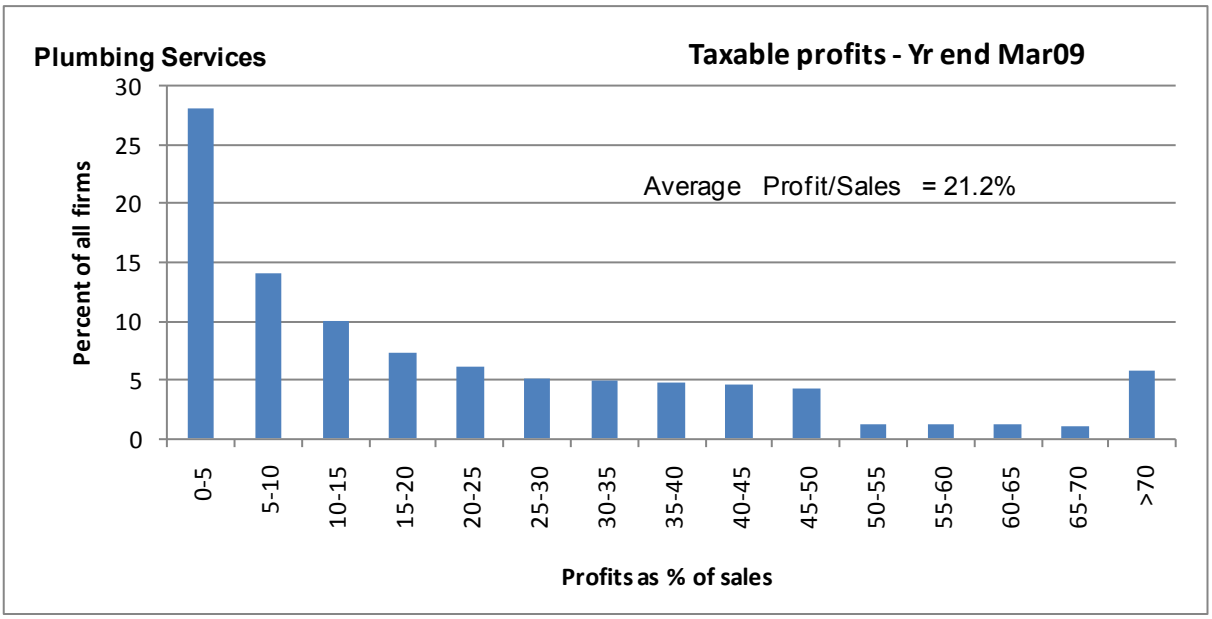


Figure 32. Profits/sales ratio – Plumbing Services

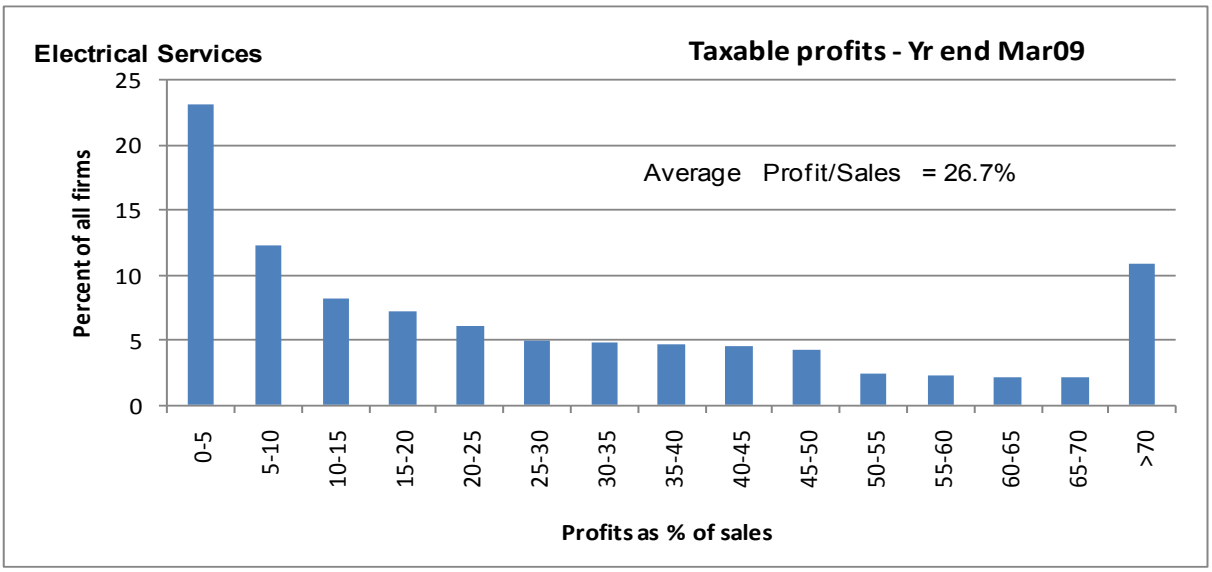


Figure 33. Profits/sales ratio –– Electrical Services

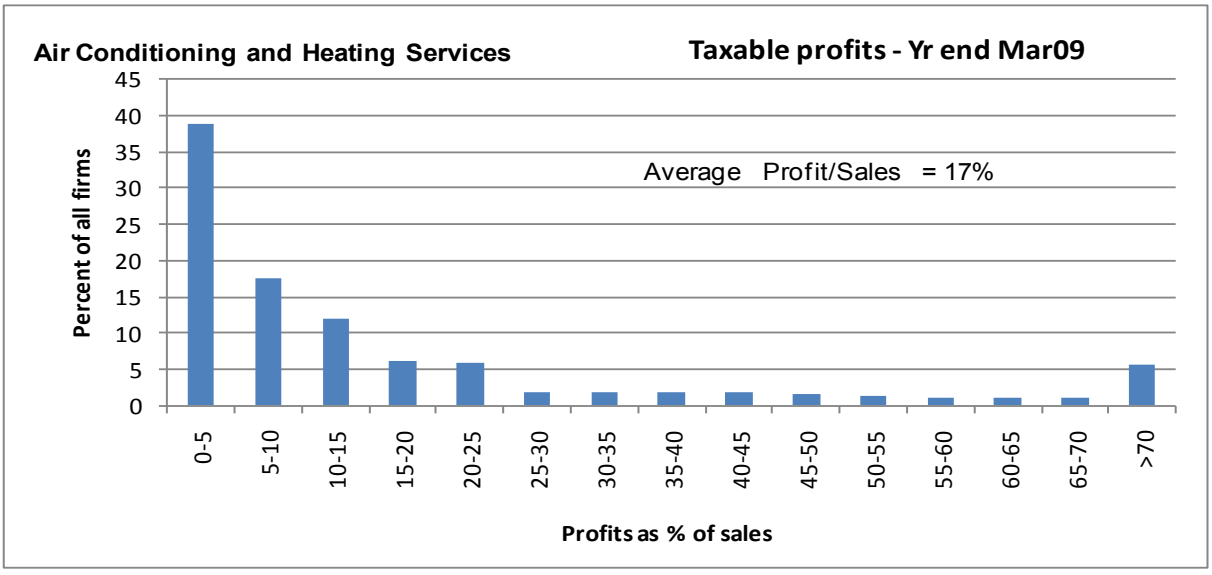


Figure 34. Profits/sales ratio – Air Conditioning and Heating Services

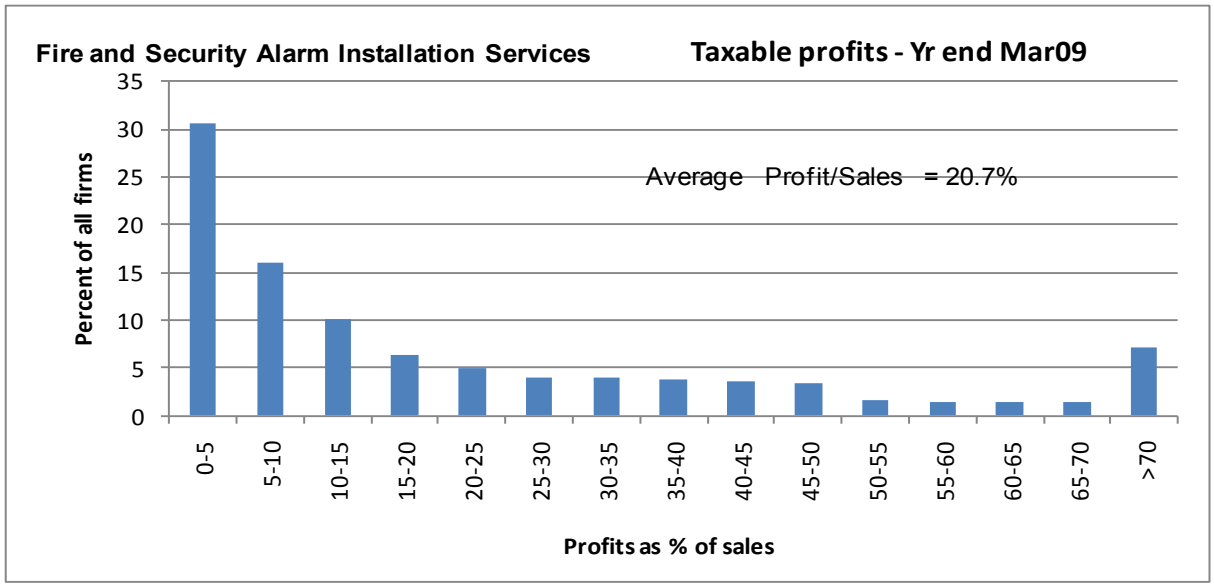


Figure 35. Profits/sales ratio – Fire and Security Alarm Installation Services

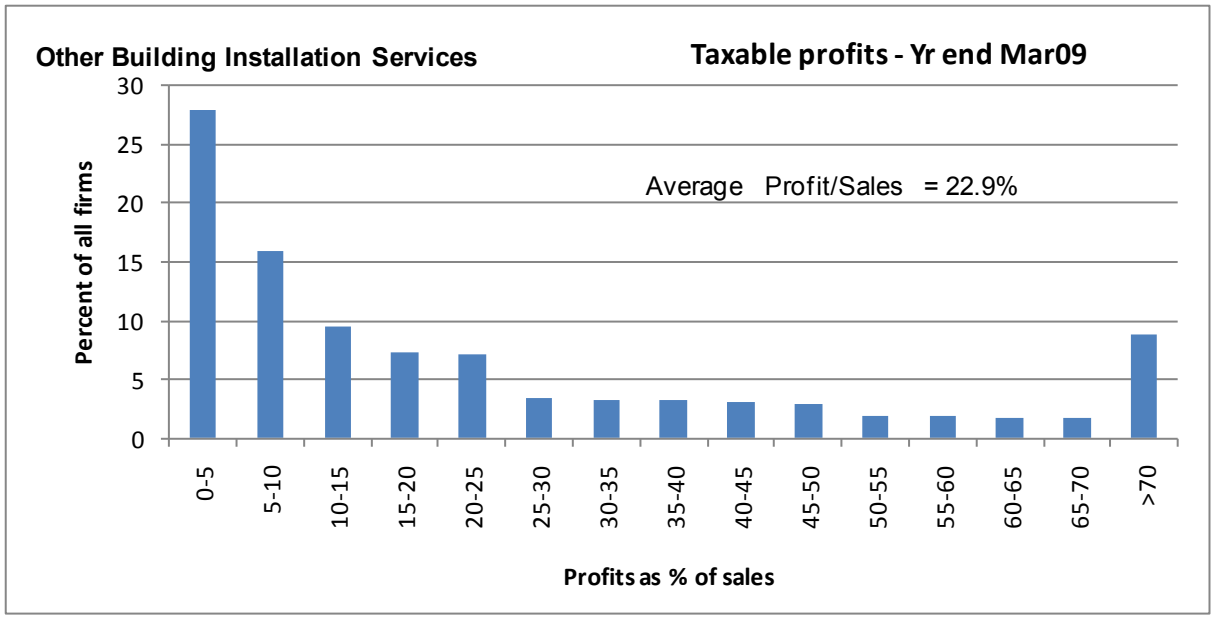


Figure 36. Profits/sales ratio – Other Building Installation Services

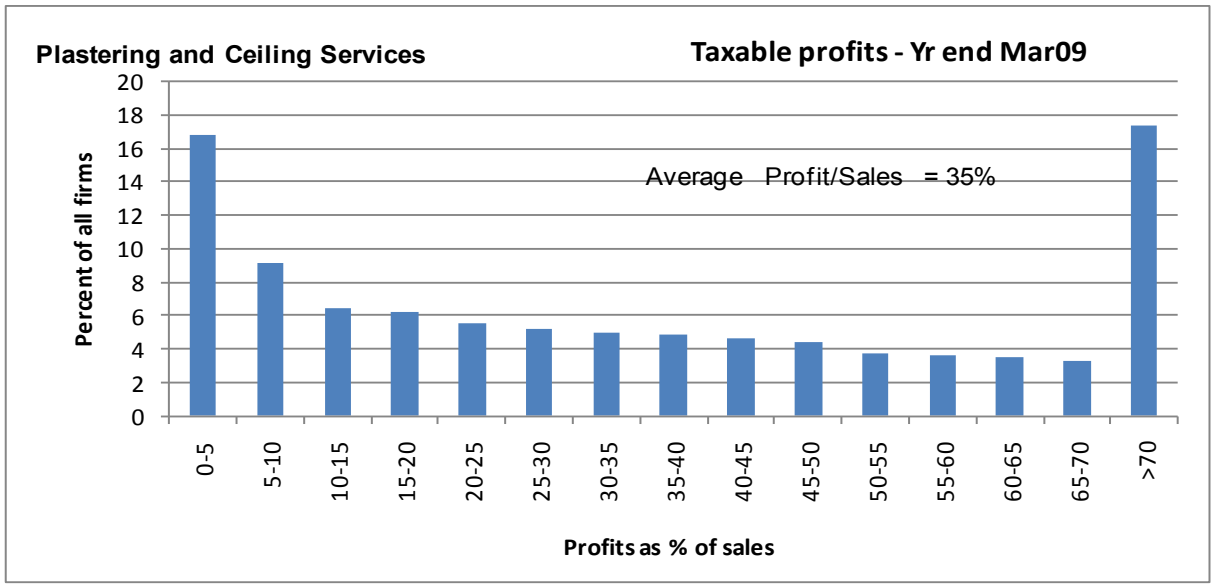


Figure 37. Profits/sales ratio – Plastering and Ceiling Services

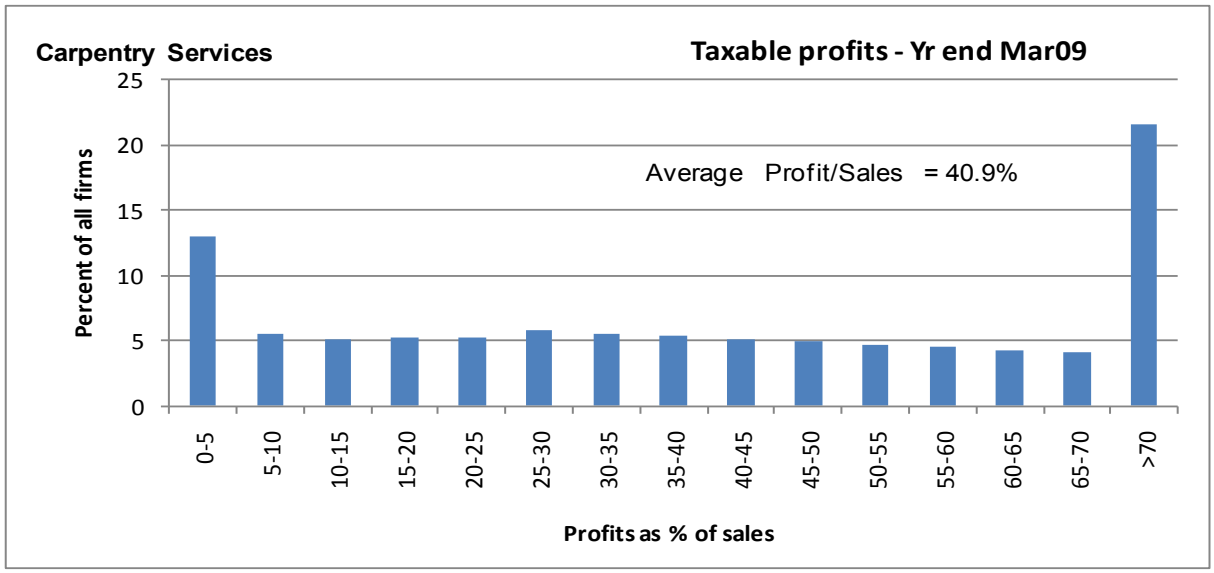


Figure 38. Profits/sales ratio – Carpentry Services

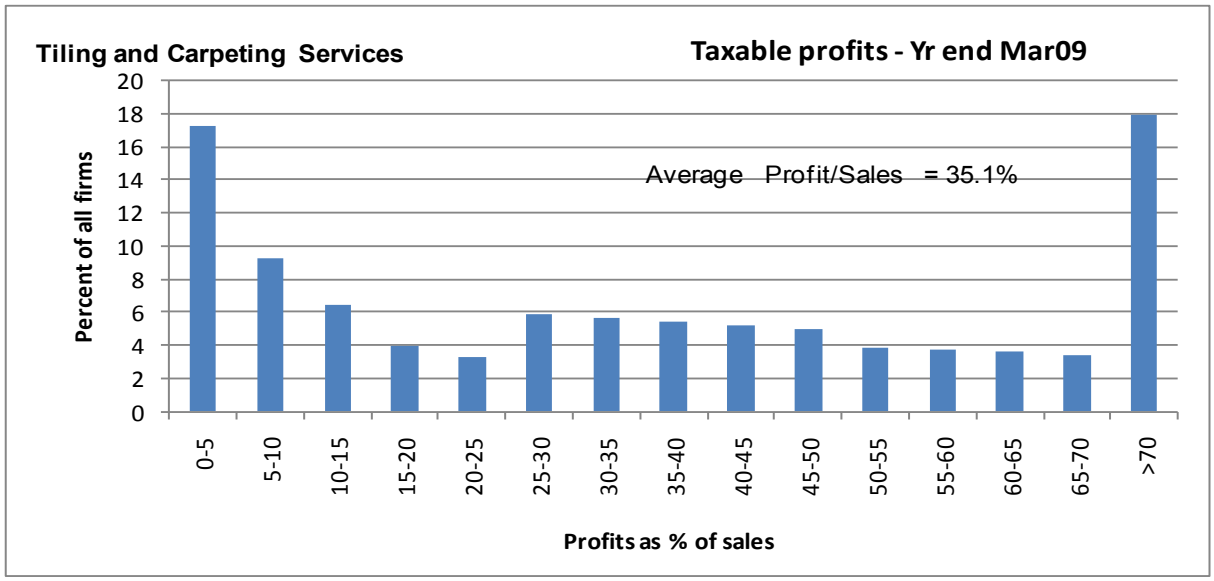


Figure 39. Profits/sales ratio – Tiling and Carpeting Services

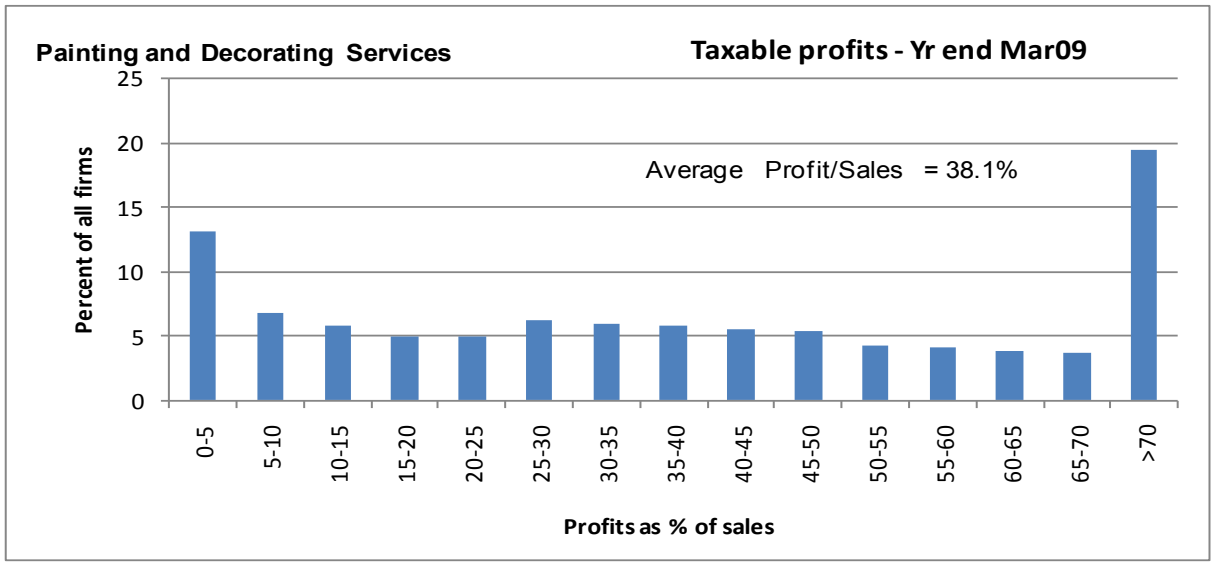


Figure 40. Profits/sales ratio – Painting and Decorating Services

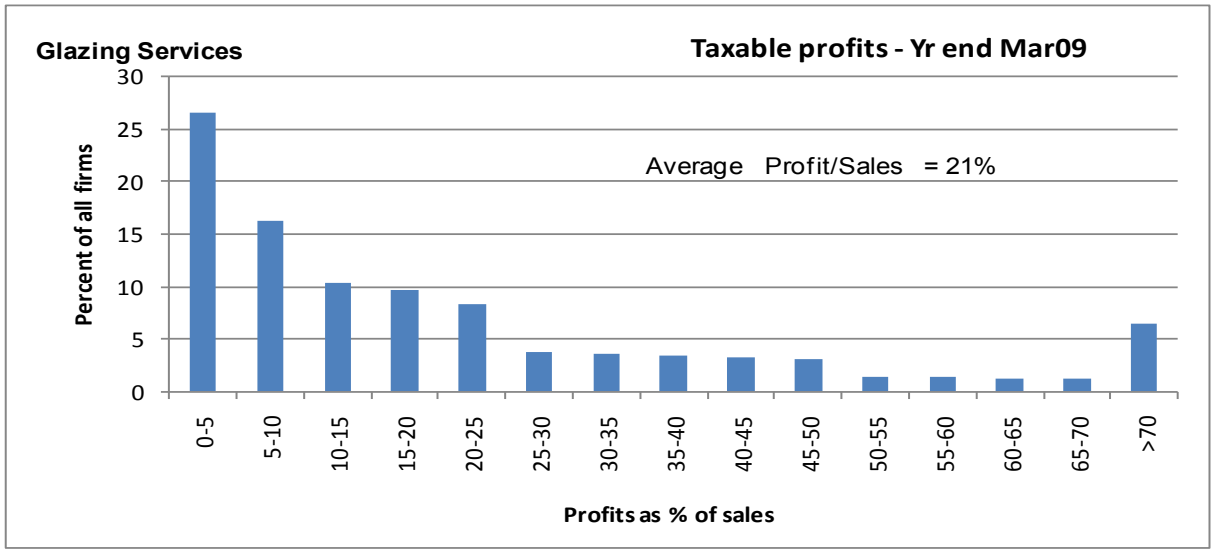


Figure 41. Profits/sales ratio – Glazing Services

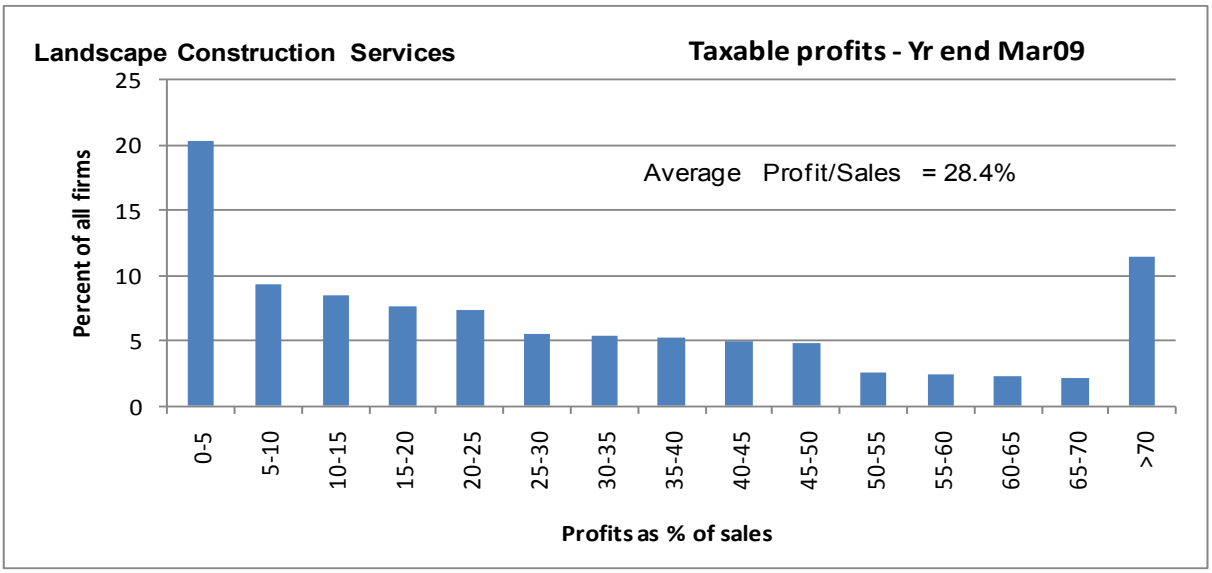


Figure 42. Profits/sales ratio – Landscape Construction Services

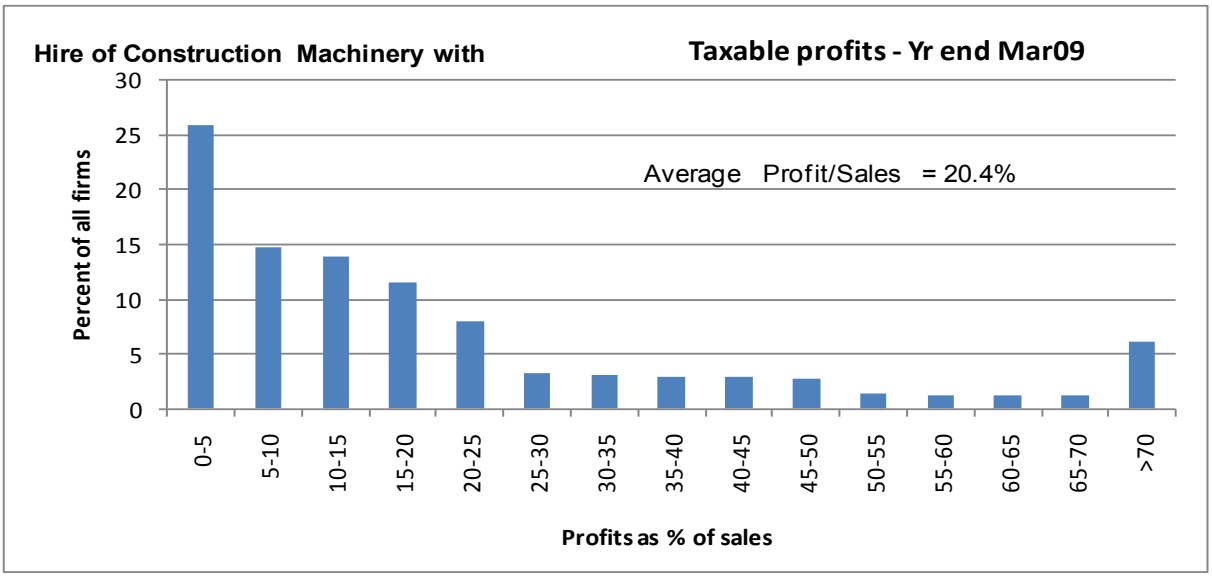


Figure 43. Profits/sales ratio – Hire of Construction Machinery with Operator

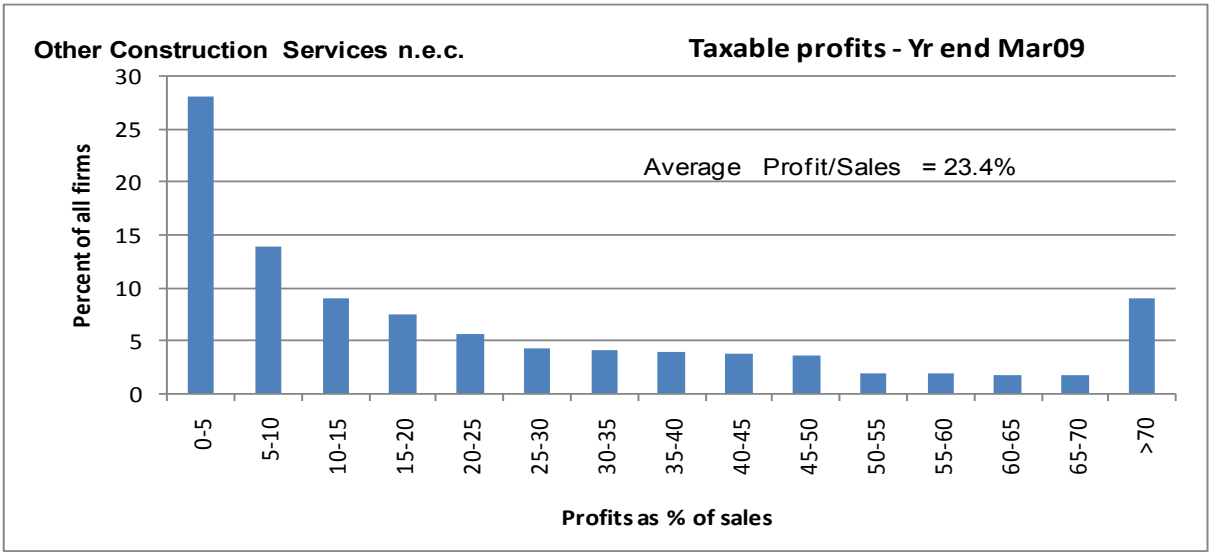


Figure 44. Profits/sales ratio – Other Construction Services n.e.c.

9.2.2 Labour productivity by sub-group

The charts that follow show the distribution of labour productivity by the 24 sub-industry categories.

Labour productivity is shown in $10,000 value-added bands. There is an unlabelled band at the start of each chart which shows either negative values or insufficient data was supplied by the firm to calculate the ratio. For the large majority of sub-industries the nil/negative responses were low. The average value-added per employee number for the sector is provided as text on each chart. This average value was calculated ignoring the nil and negative responses. Some sub-industries have a quite large number of responses in the far-right i.e. for the $150,000+ per employee band. The averages were calculated allowing for this $150,000+ values.

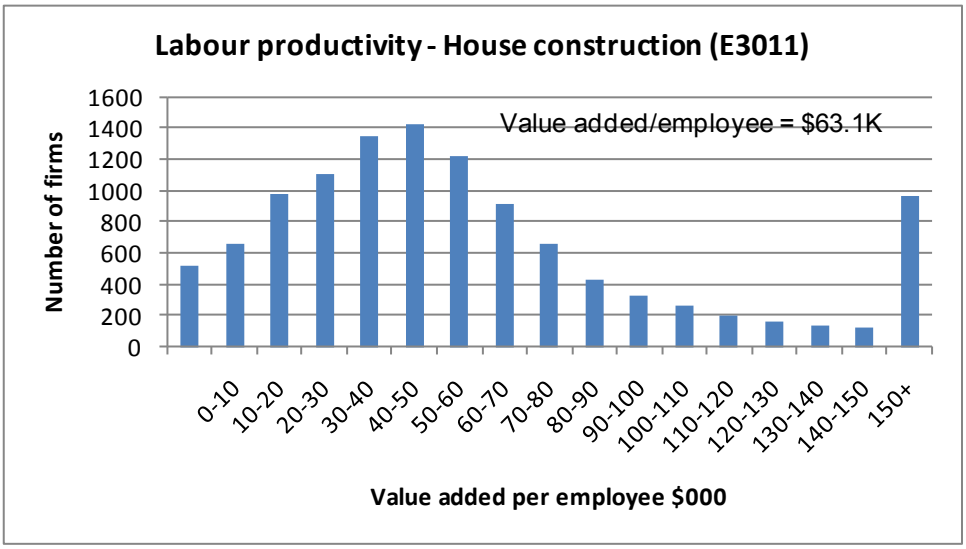


Figure 45. Labour productivity – House construction

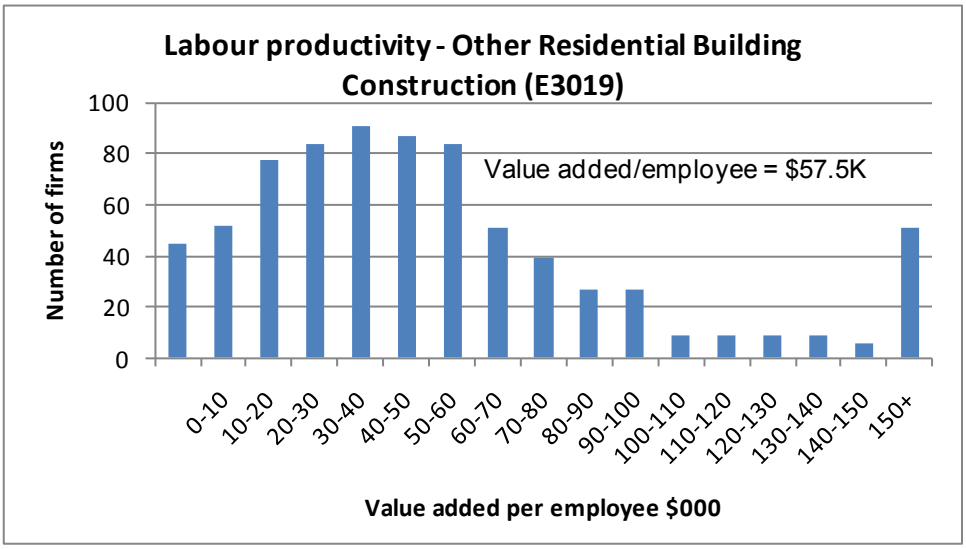


Figure 46. Labour productivity – Other Residential Building Construction

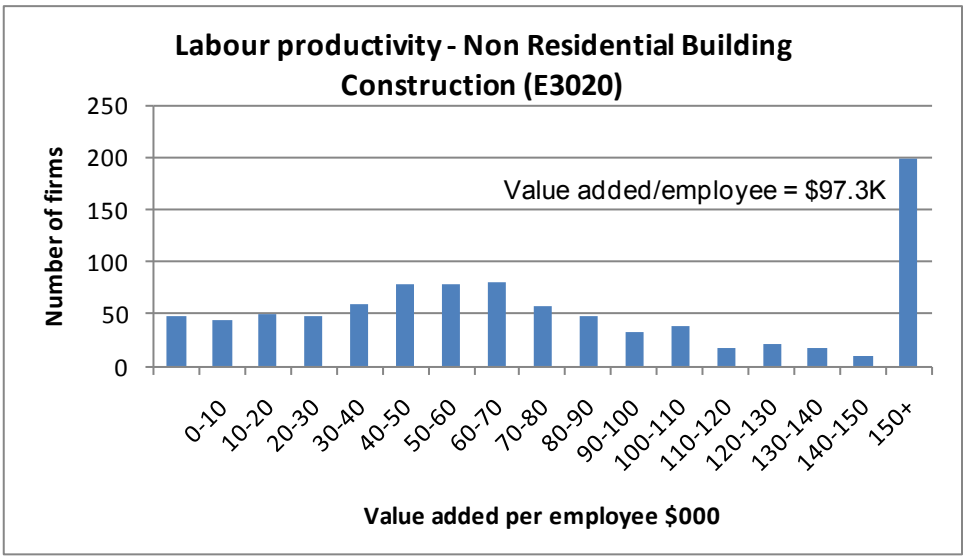


Figure 47. Labour productivity – Non-residential Building

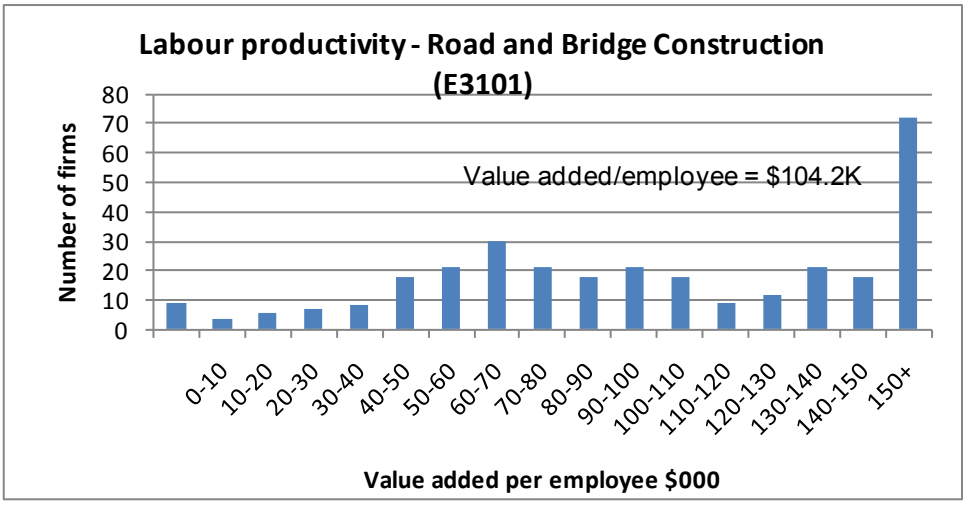


Figure 48. Labour productivity – Road and Bridge Construction

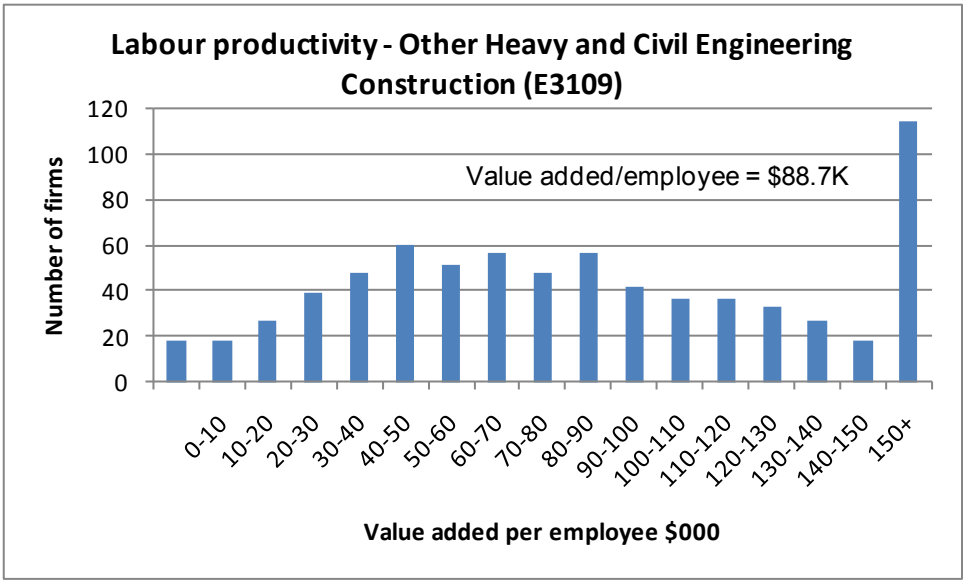


Figure 49. Labour productivity – Other Heavy and Civil Engineering Construction

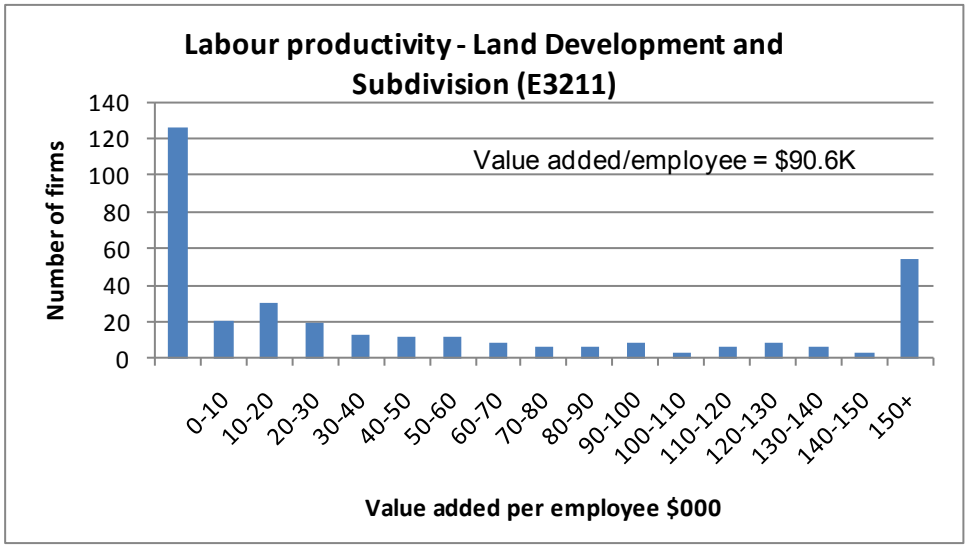


Figure 50. Labour productivity – Land Development and Subdivision

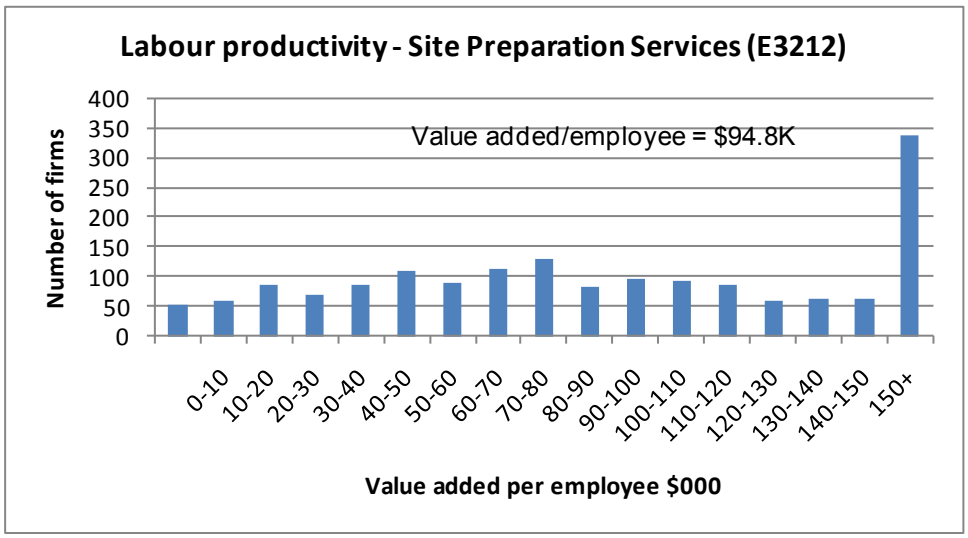


Figure 51. Labour productivity – Site Preparation Services

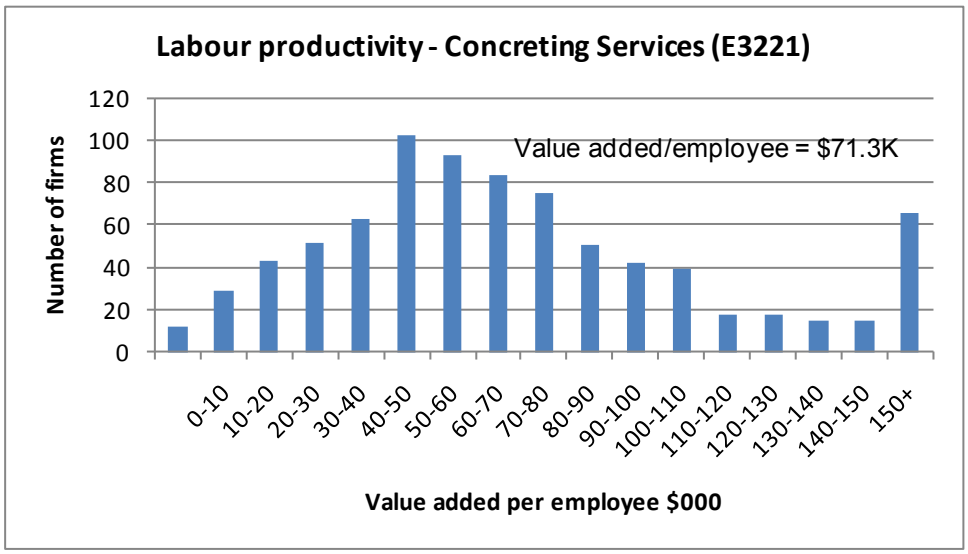


Figure 52. Labour Productivity – Concreting Services

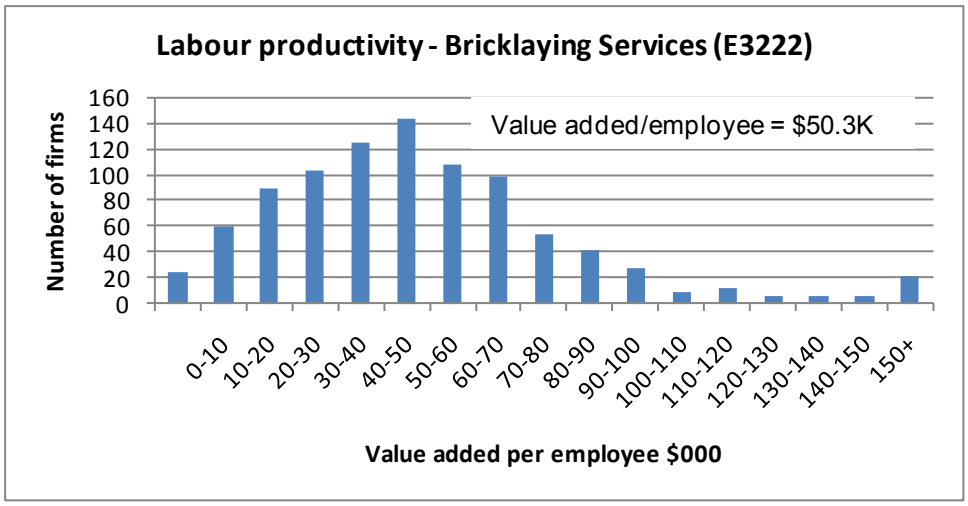


Figure 53. Labour Productivity – Bricklaying Services

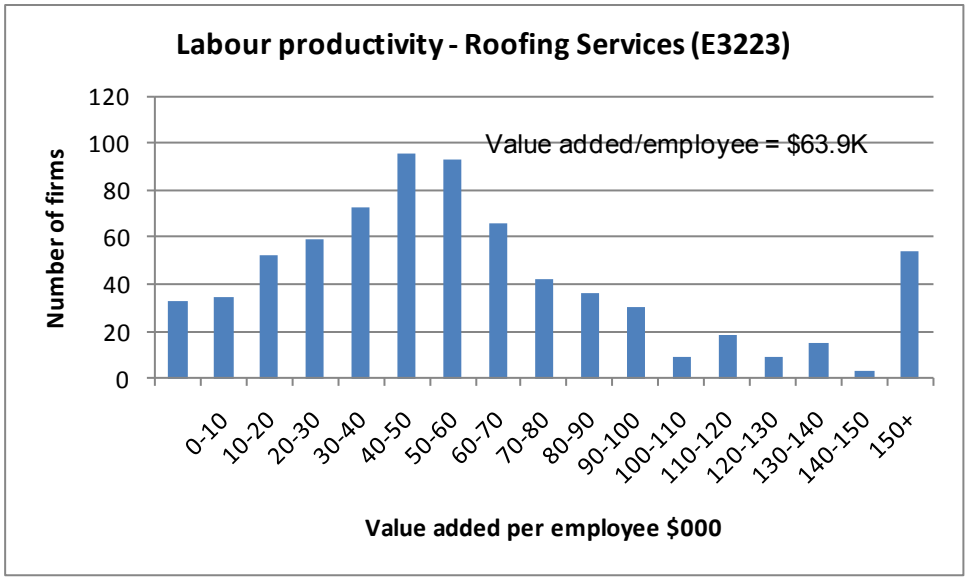


Figure 54. Labour productivity – Roofing Services

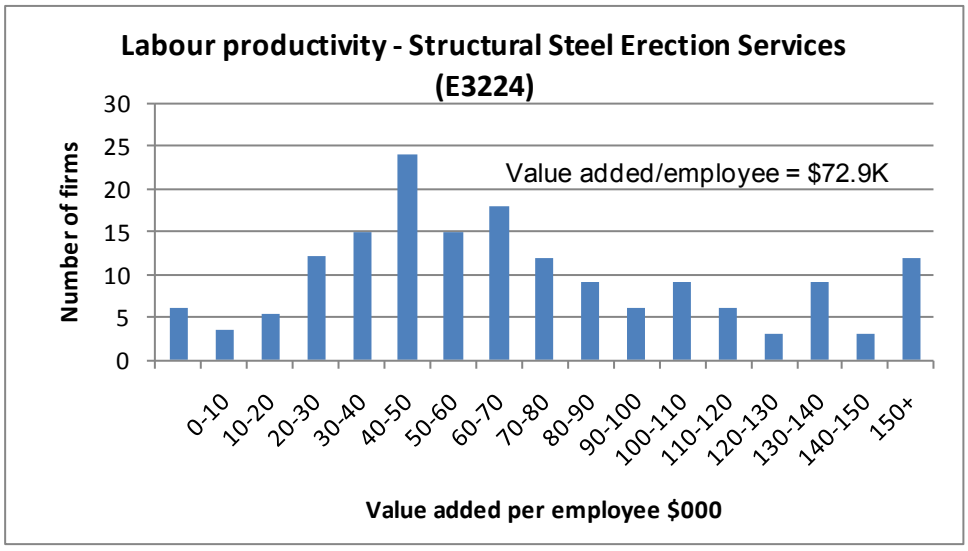


Figure 55. Labour productivity – Structural Steel Erection Services

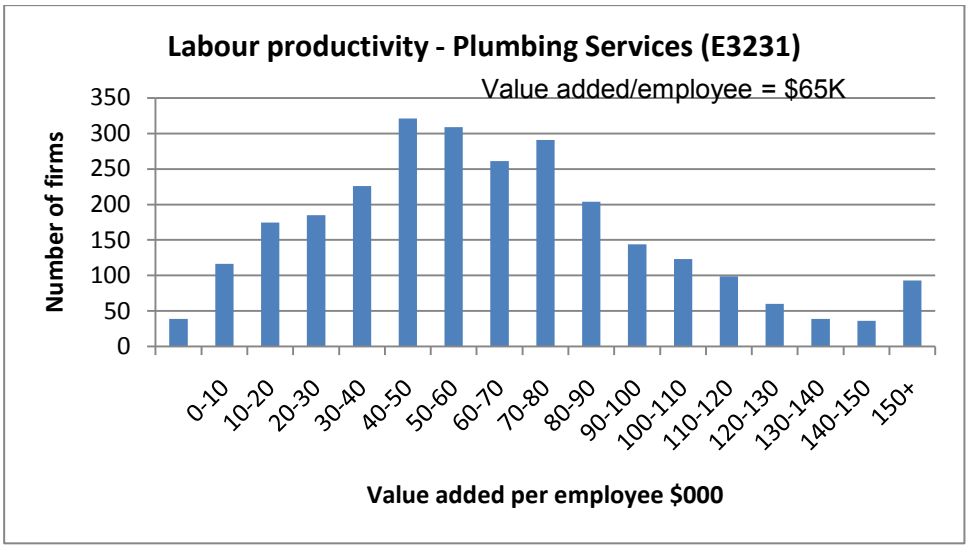


Figure 56. Labour productivity – Plumbing Services

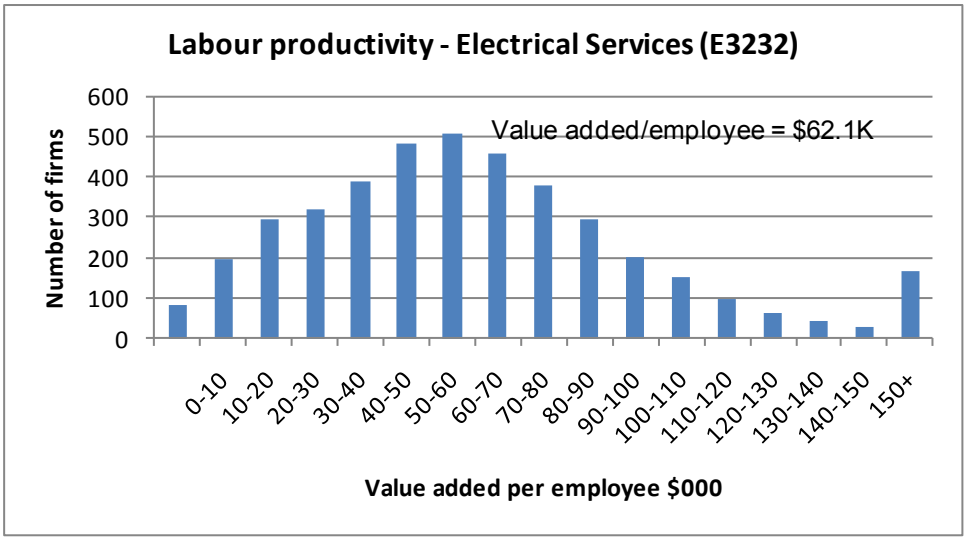


Figure 57. Labour productivity – Electrical Services

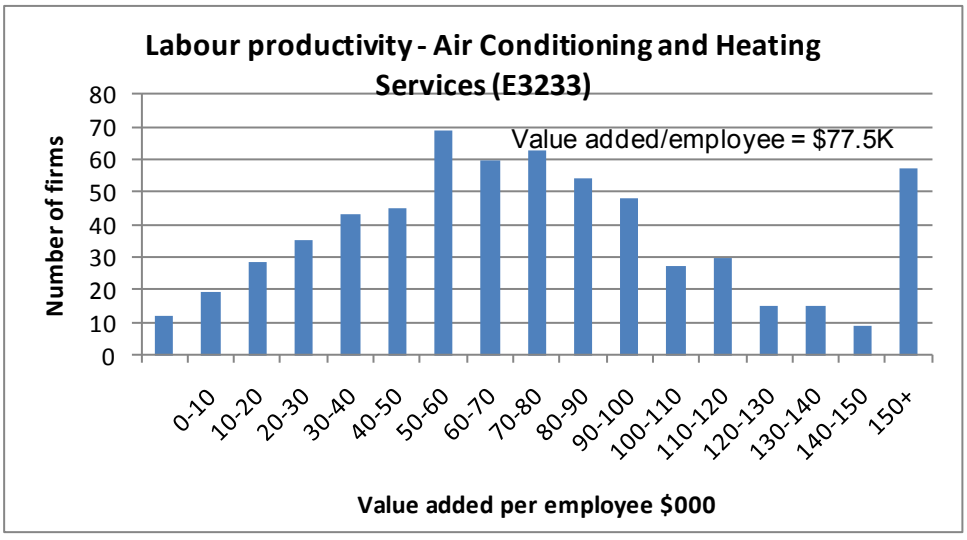


Figure 58. Labour productivity – Air Conditioning and Heating Services

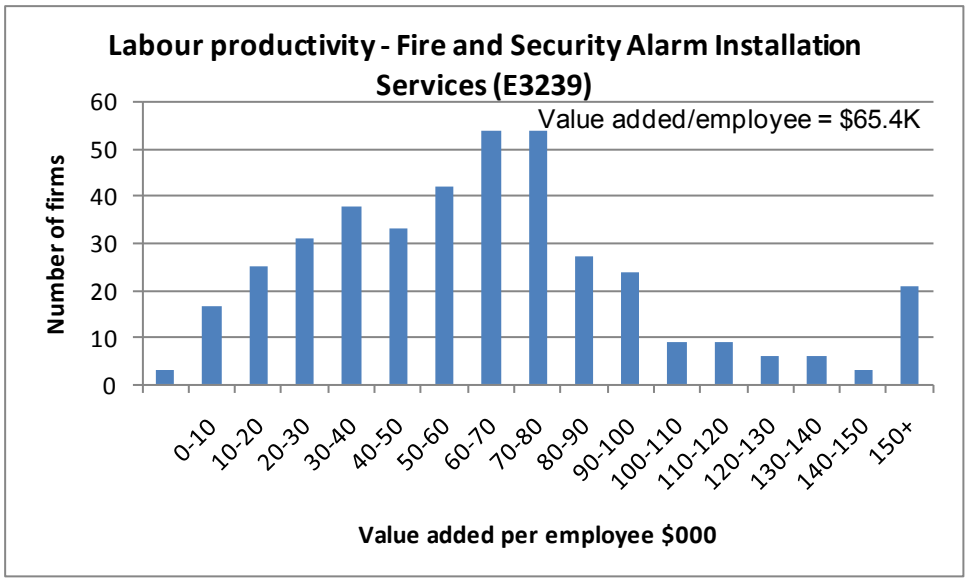


Figure 59. Labour productivity – Fire and Security Alarm Installation Services

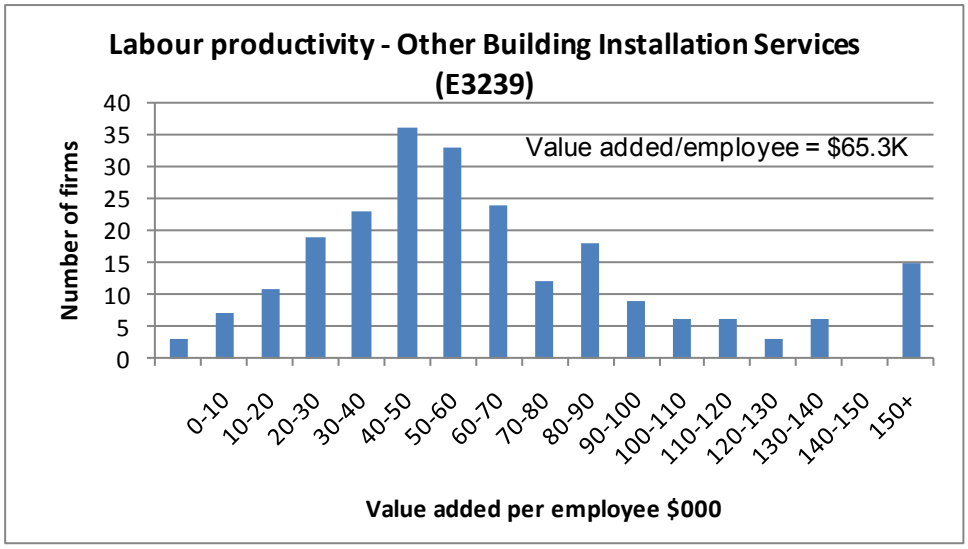


Figure 60. Labour productivity – Other Building Installation Services

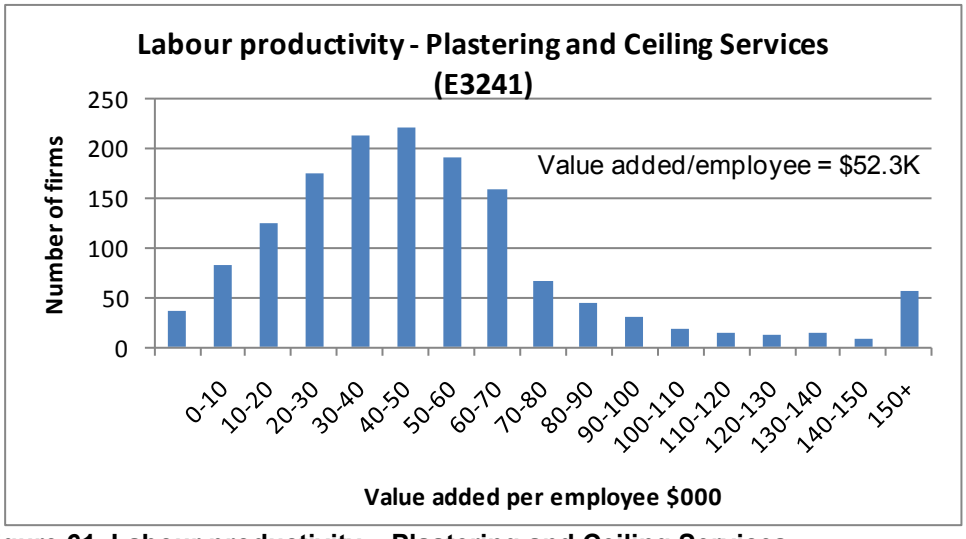


Figure 61. Labour productivity – Plastering and Ceiling Services

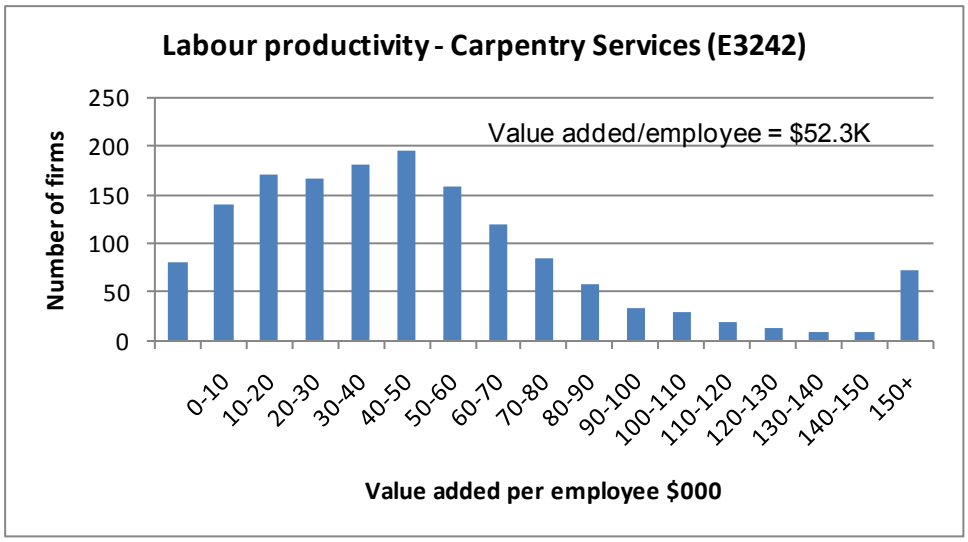


Figure 62. Labour productivity – Carpentry Services

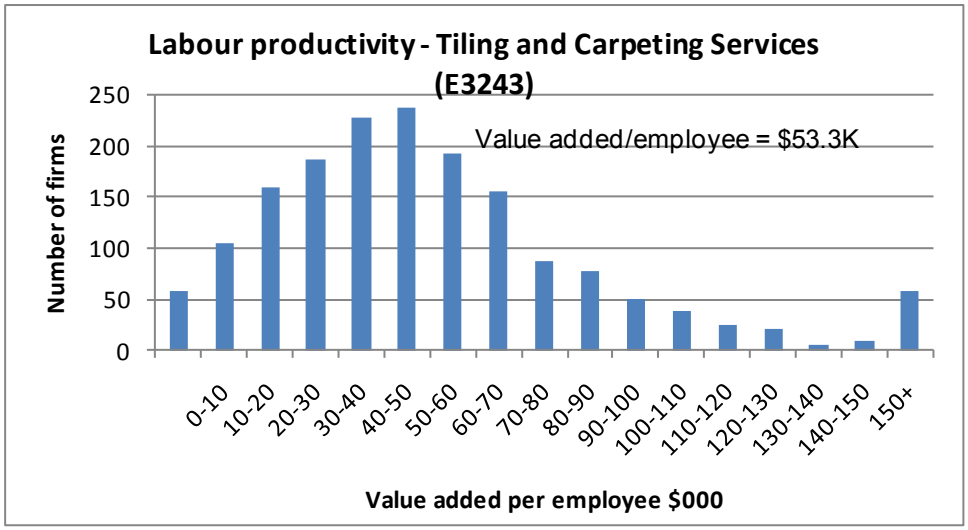


Figure 63. Labour productivity – Tiling and Carpeting Services

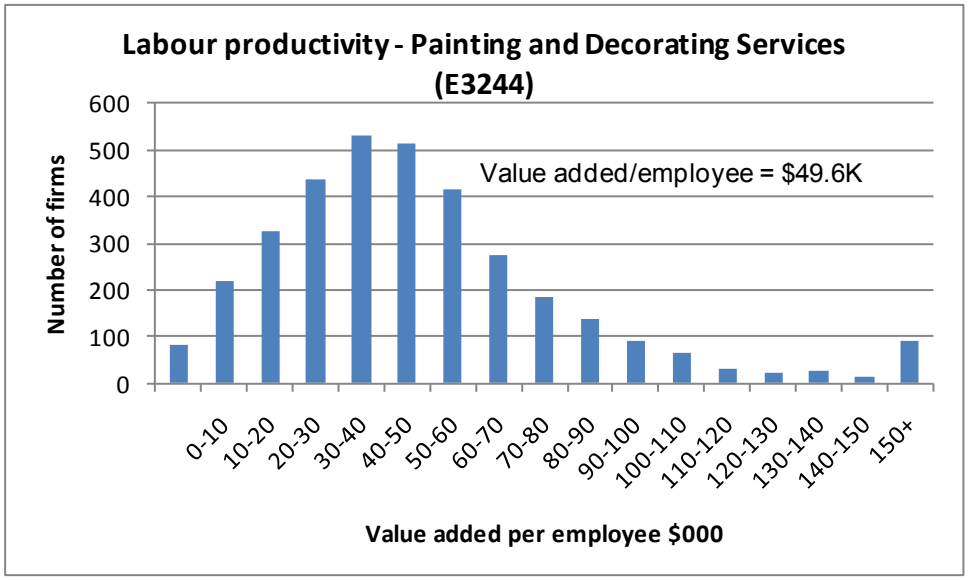


Figure 64. Labour productivity – Painting and Decorating Services

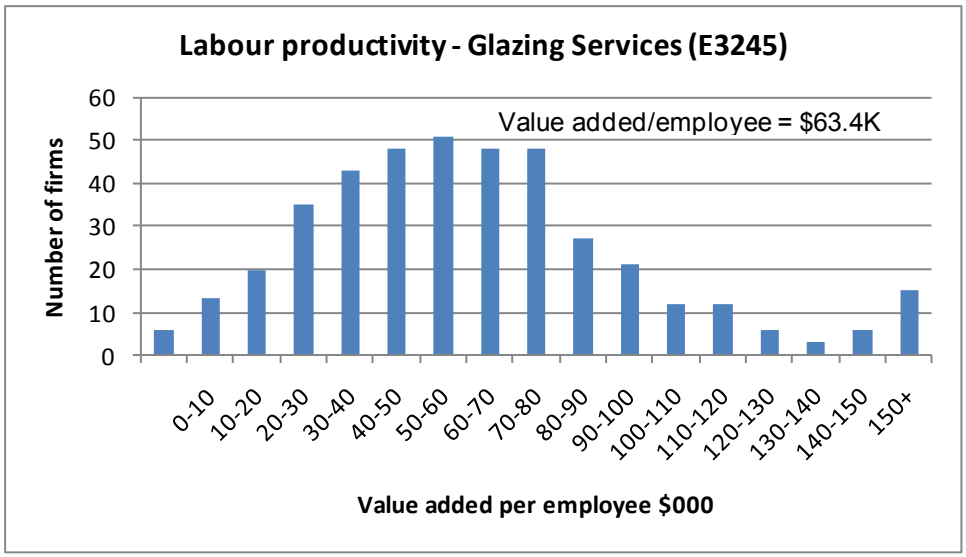


Figure 65. Labour productivity – Glazing Services

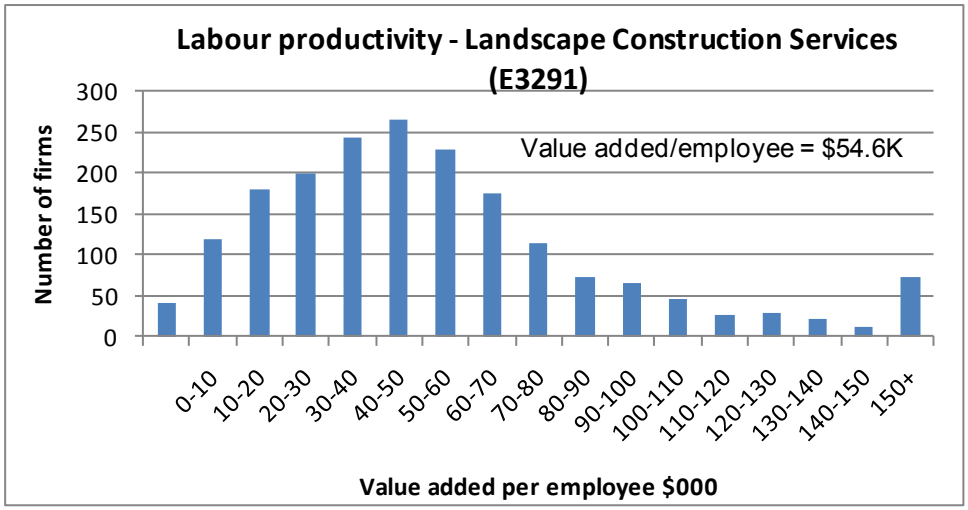


Figure 66. Labour productivity – Landscape Construction Services

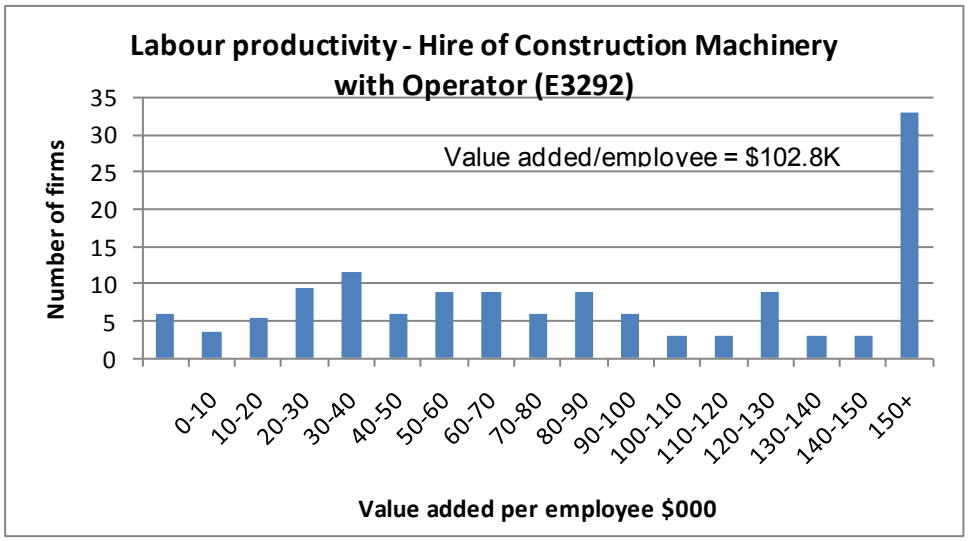


Figure 67. Labour productivity – Hire of Construction Machinery with Operator

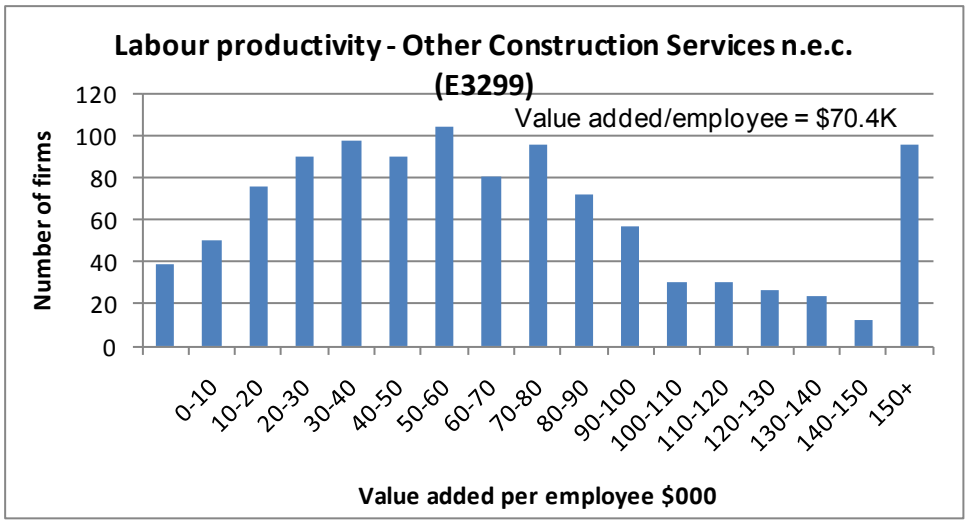


Figure 68. Labour productivity – Other Construction Services n.e.c.

9.2.3 Cumulative percentage charts for profit margins

The following charts provide the same information as the bar charts in Figure 23 to Figure 44, but the line is the cumulative percentage of firms with profits at or below the amount given on the vertical axis. We have shown average profit ratios, but as the distributions are skewed to the right the majority of firms are below the average profit margin.

The way to use the charts are for an owner to calculate his/her profit margins in the period (2008/09) and read-off on the vertical axis, from the appropriate industry chart, what percentage of firms are above his/her firm.

For example, a house construction firm owner estimates his taxable profit to sales ratio as 35%. From Figure 69 a vertical line at 35% profits intersects the line at about 61% of firms on the vertical axis. So 39% of firms have a higher profit ratio than his firm. On the same chart we note that 50% of firms have a profit ratio of about 22% or less and this is a quite different measure to the average profit margin shown on the chart of 29.8% (higher due to the skewed distribution).

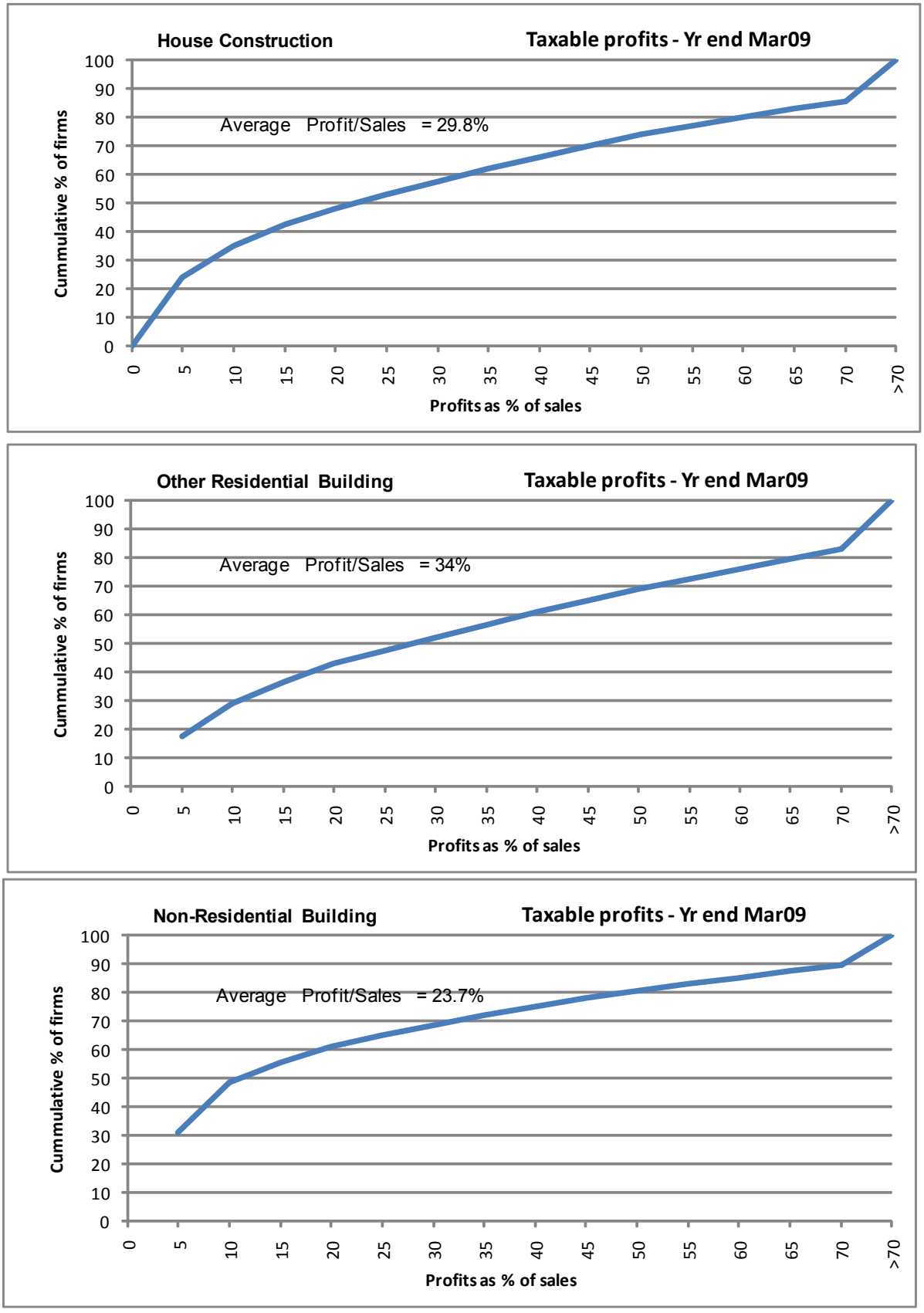
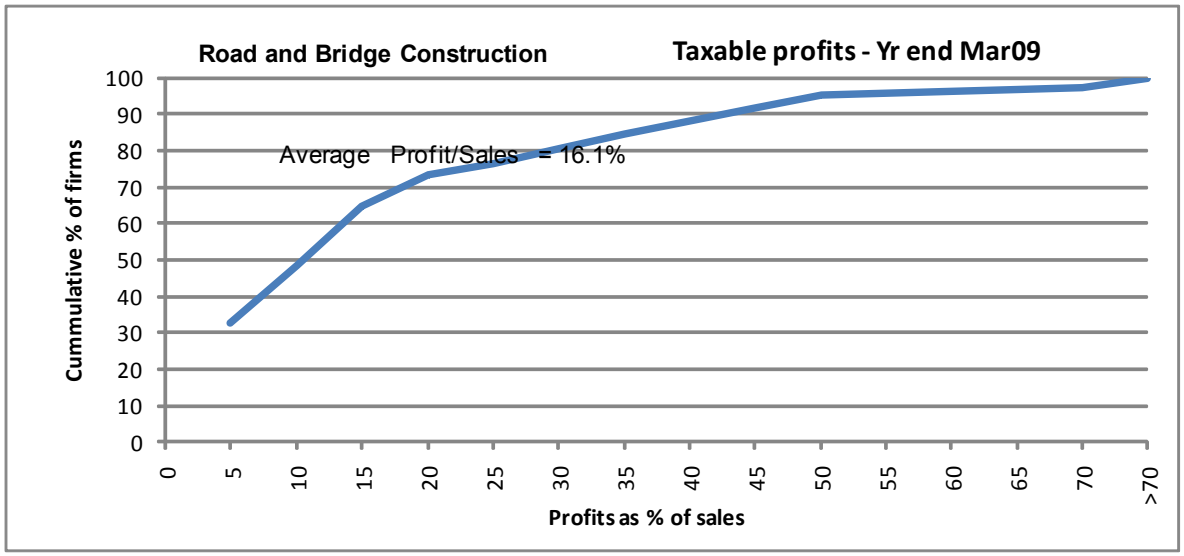
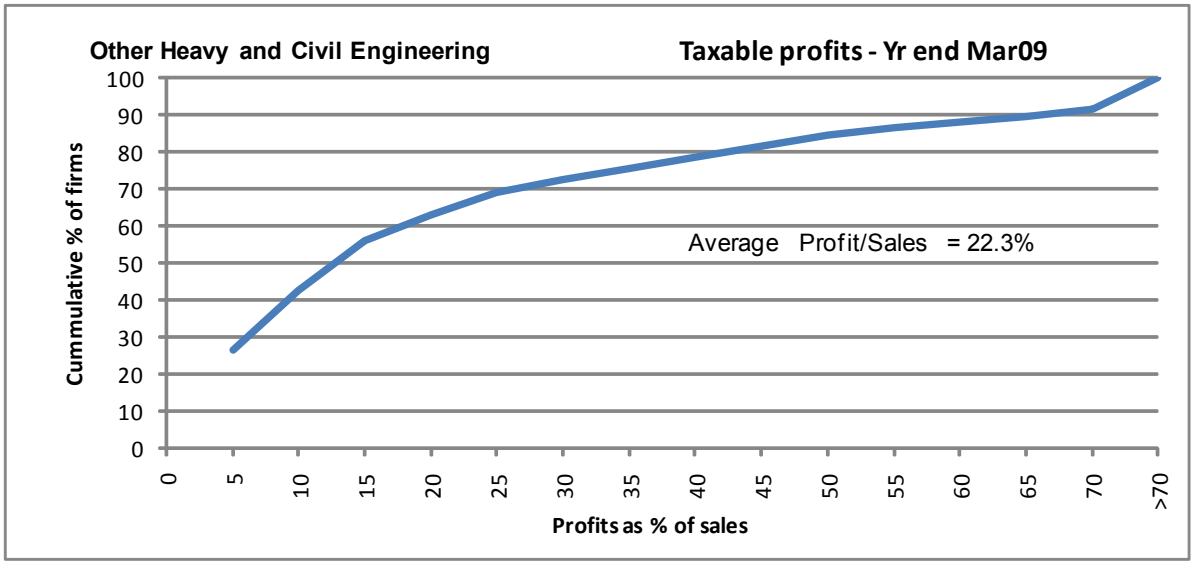


Figure 69. Housing, Other Residential, Non-residential Building cumulative profit curves





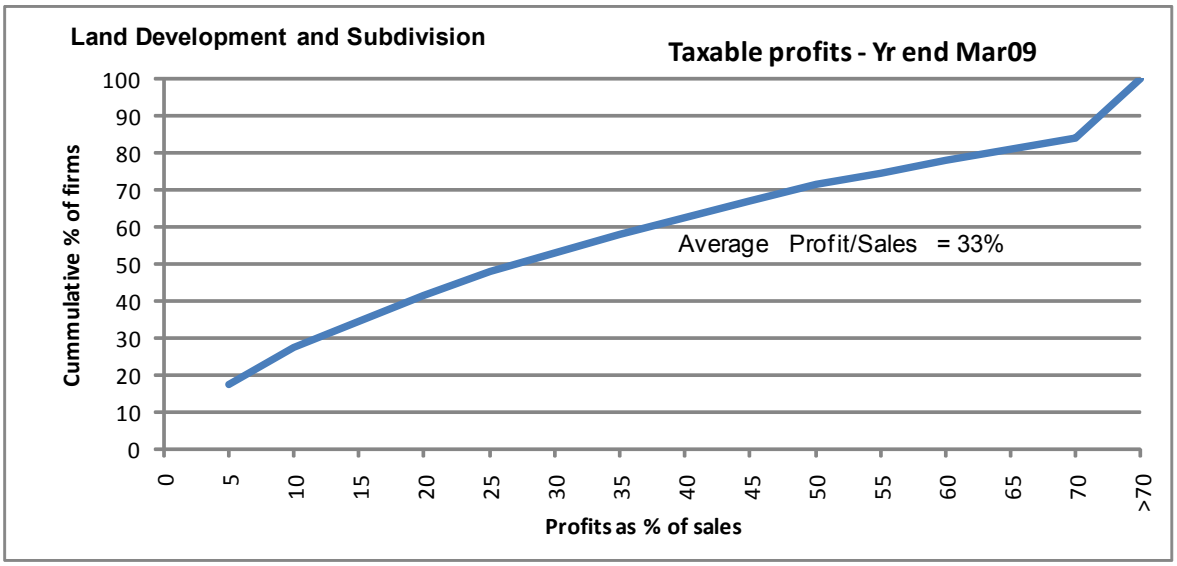
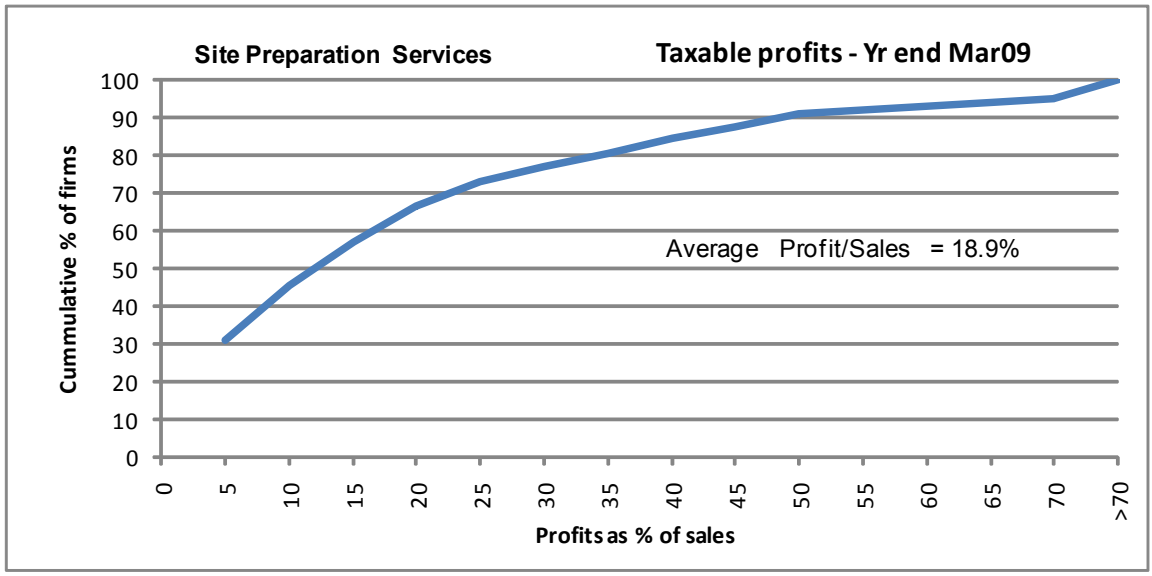
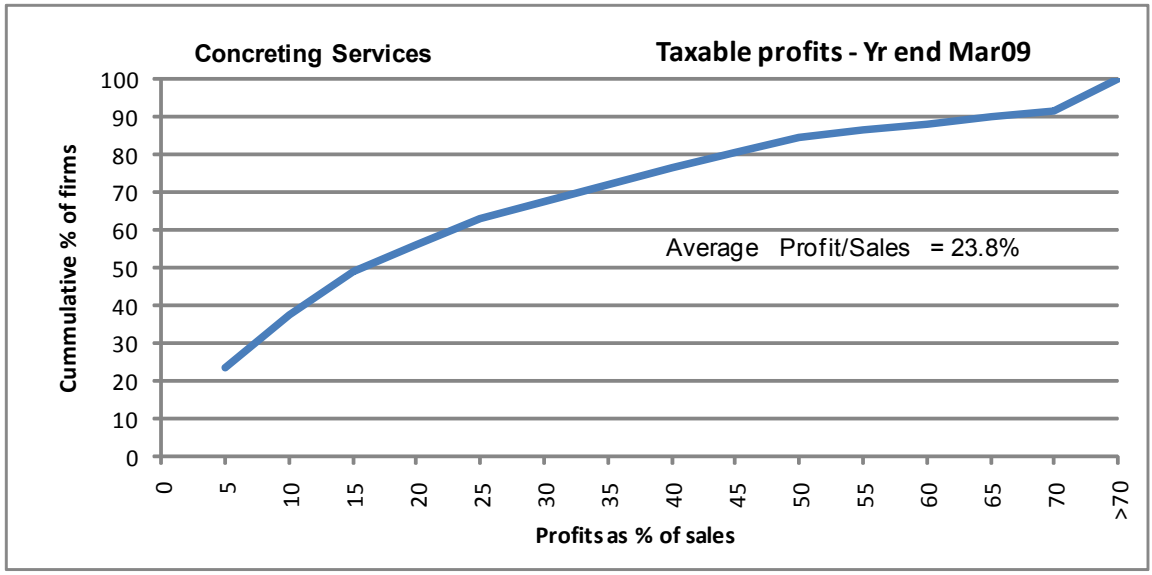


Figure 70. Road and Bridge Construction, Other Heavy Engineering, Land Development cumulative profit curves





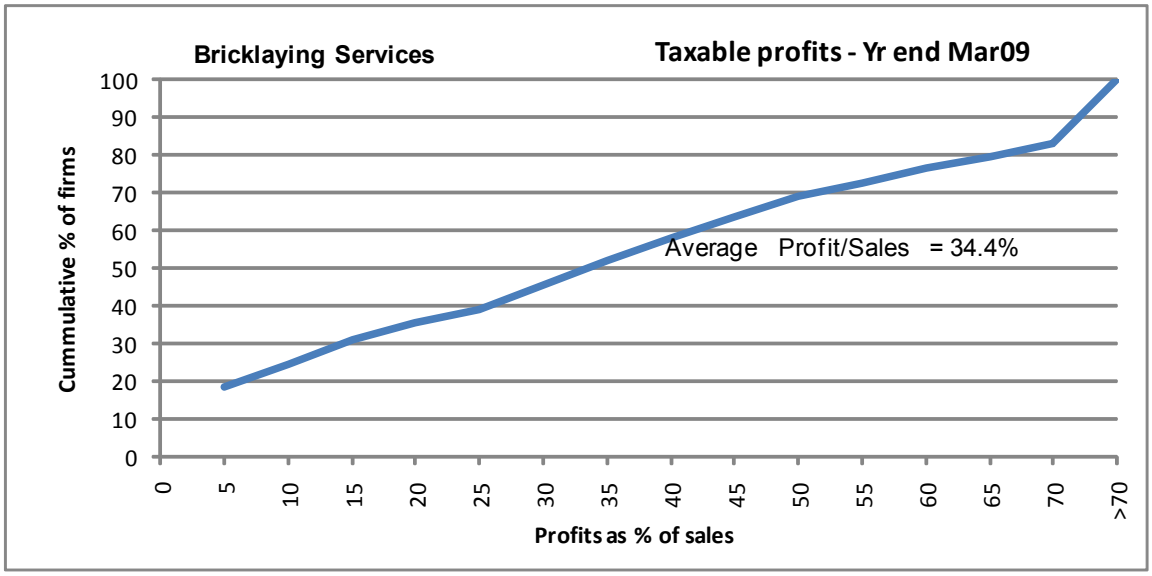
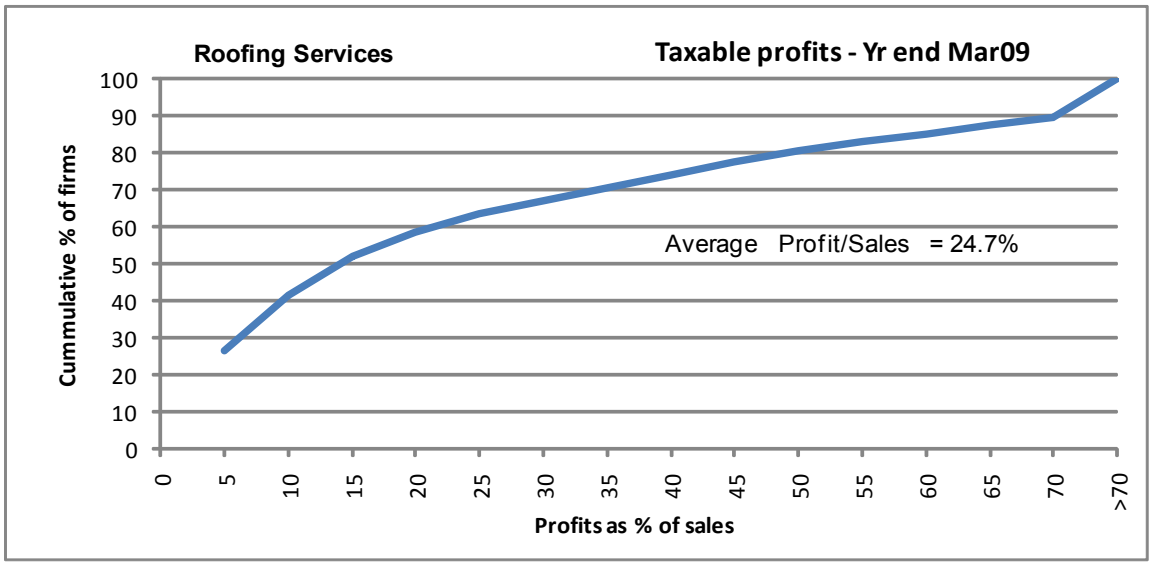
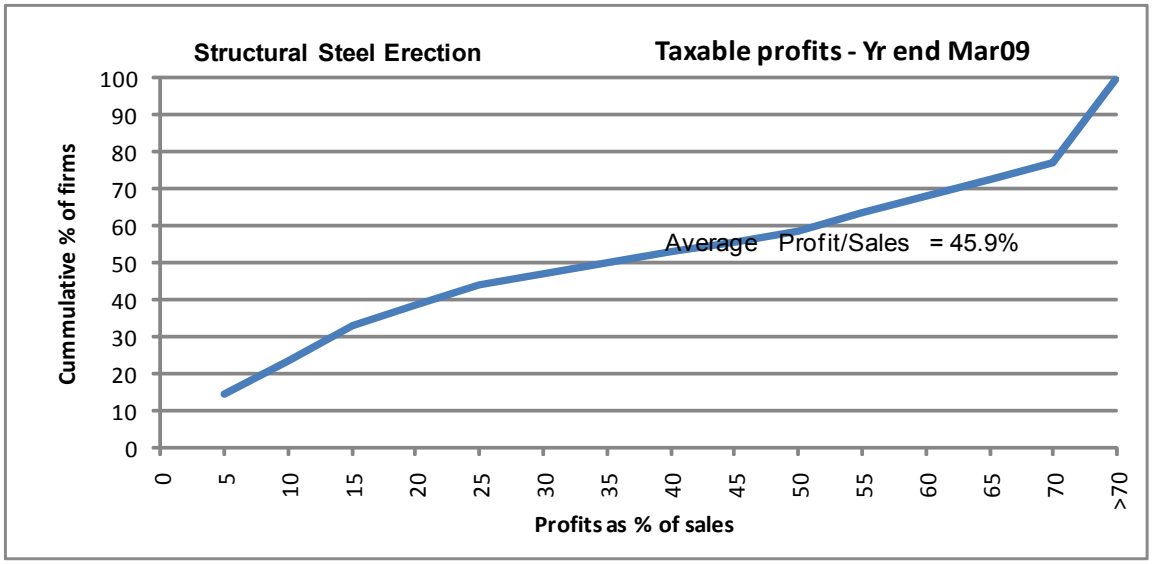


Figure 71. Site Preparation, Concreting, Bricklaying cumulative profit curves





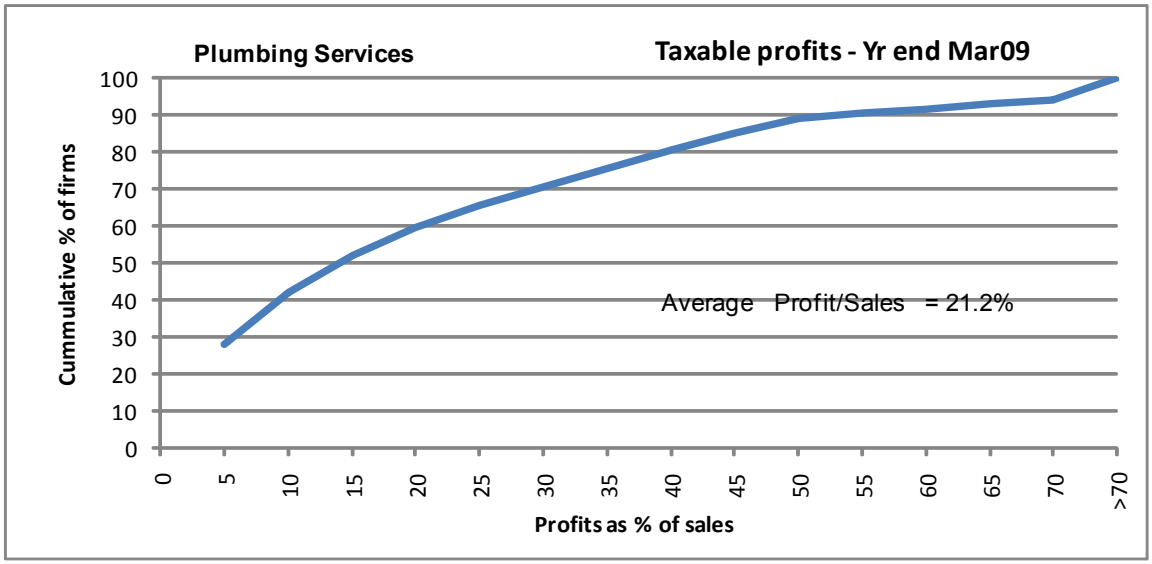
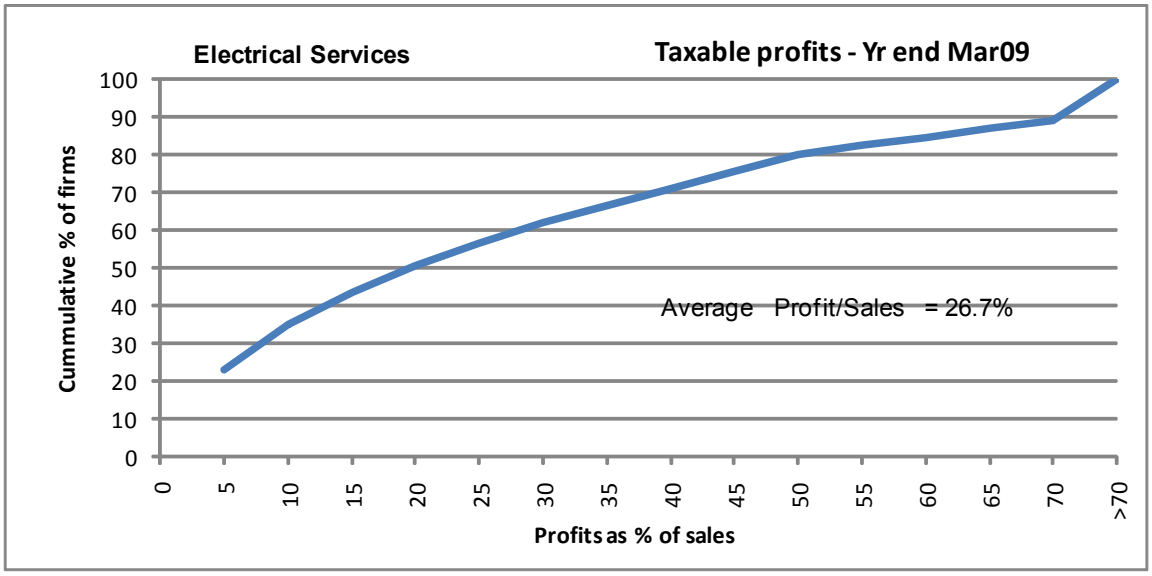
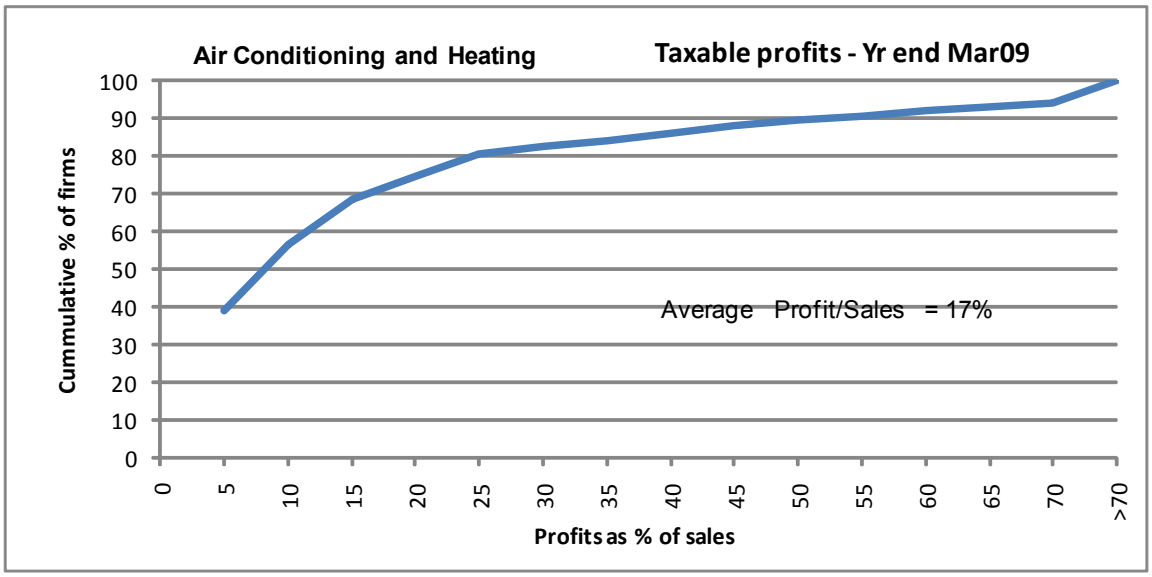


Figure 72. Roofing, Structural Steel Erection, Plumbing cumulative profit curves





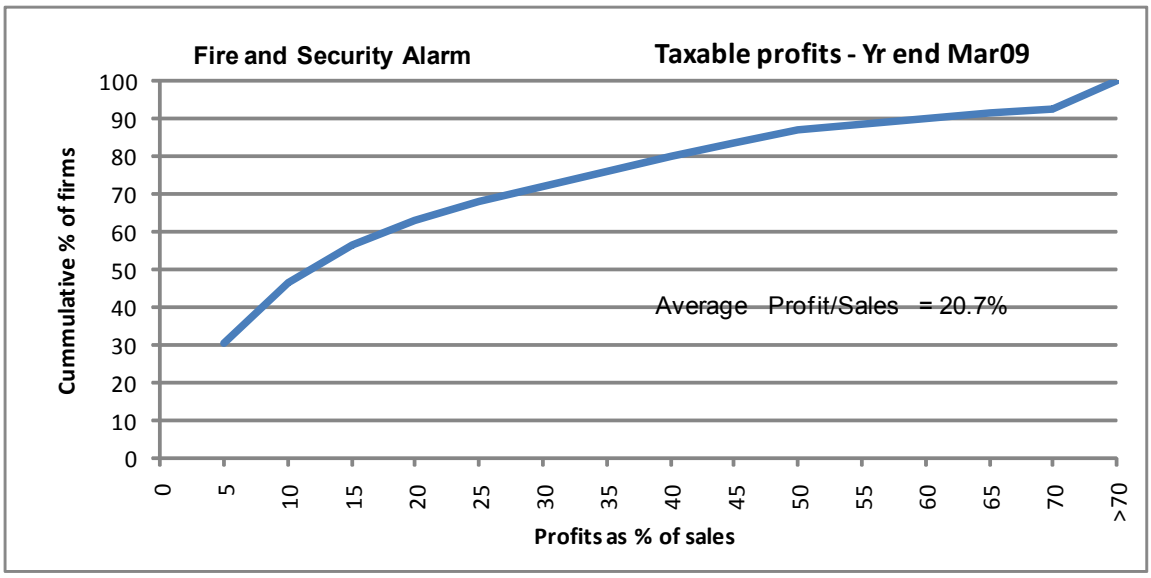
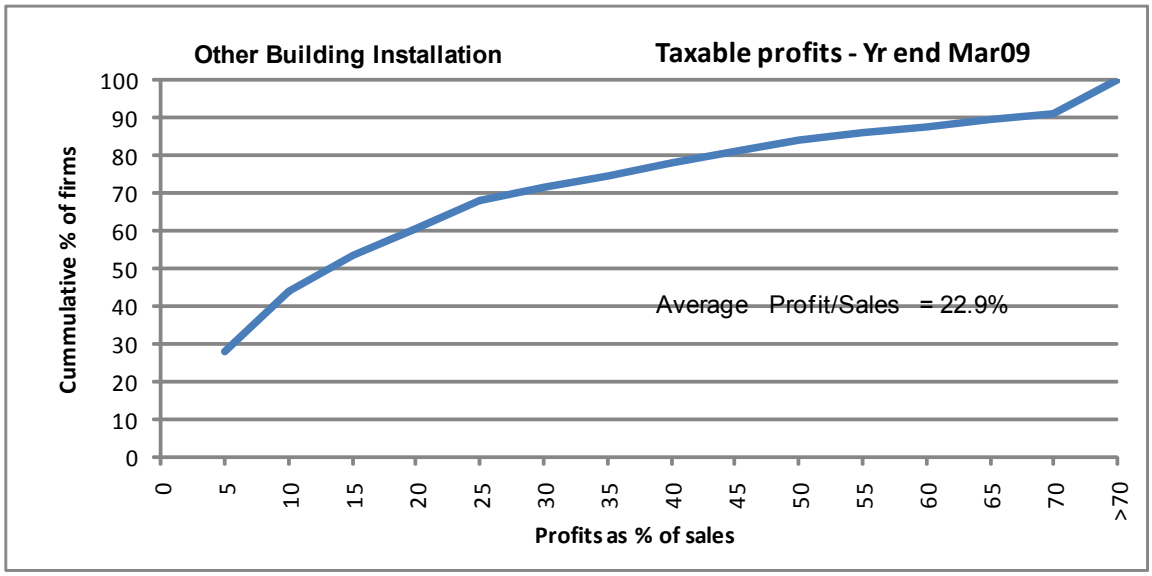
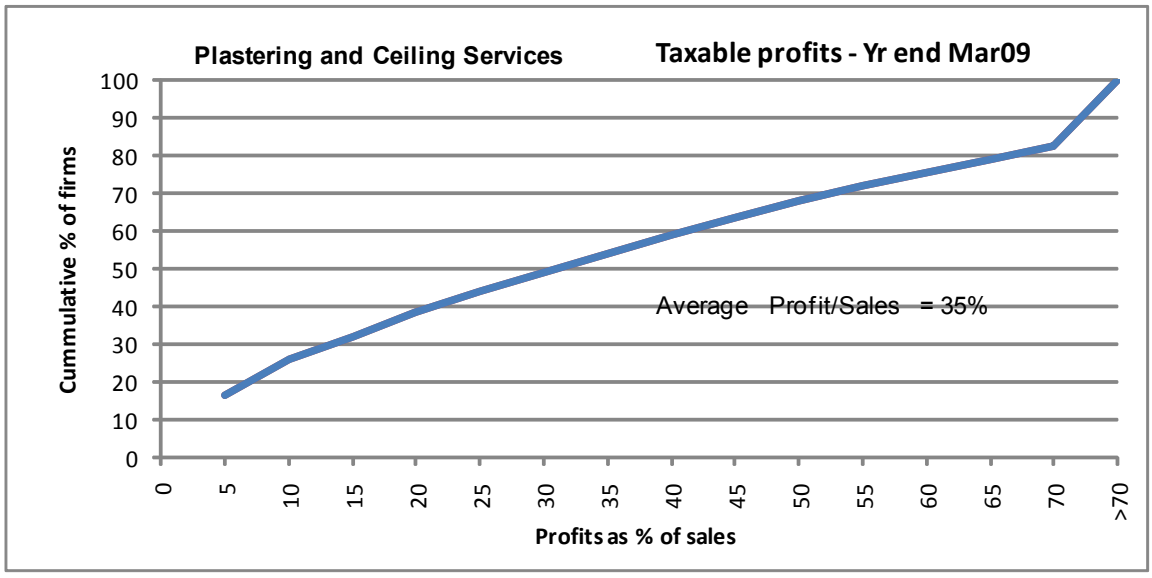


Figure 73. Electrical Services, Air Conditioning/Heating, Fire and Security Alarm cumulative profit curves





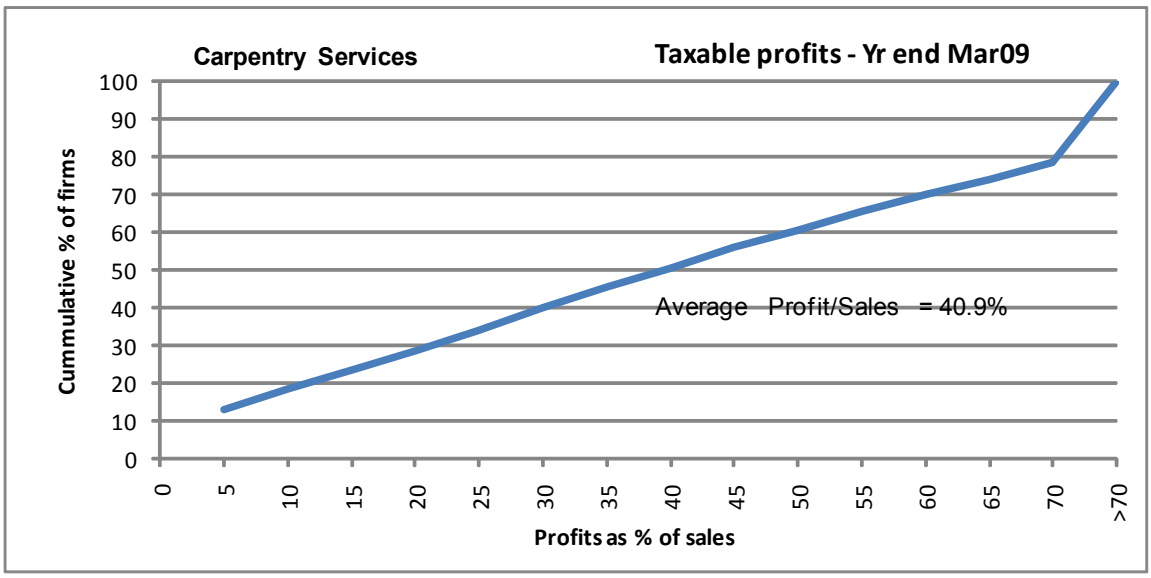
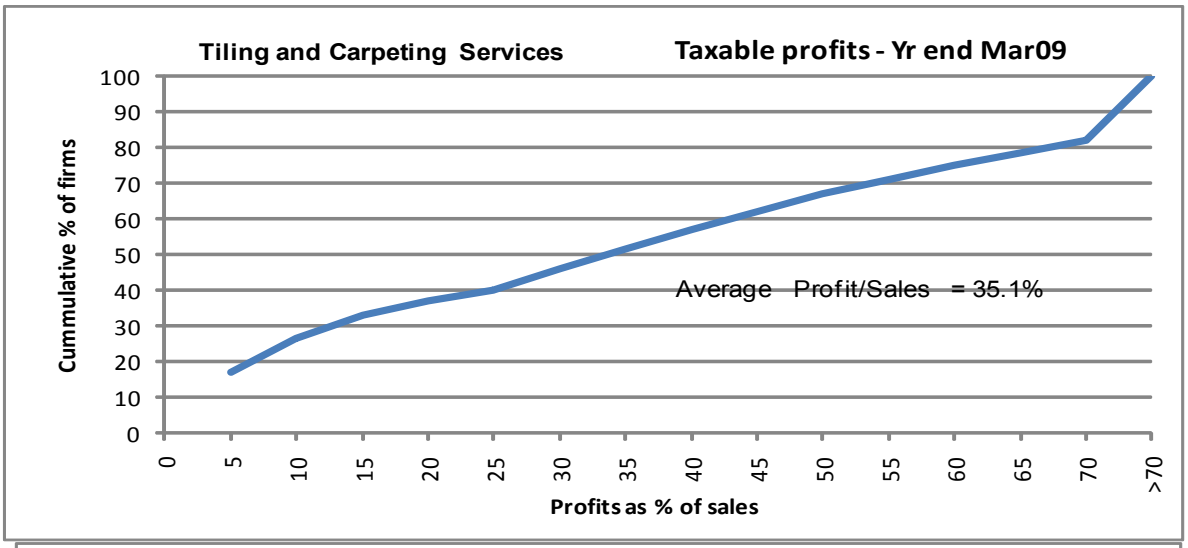
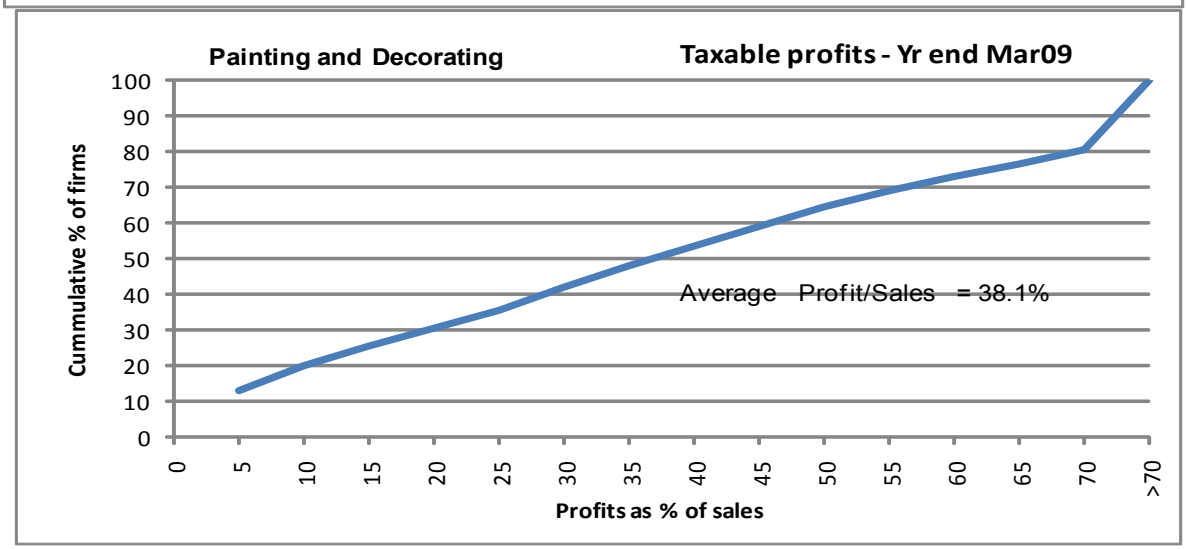


Figure 74. Other Building Installation, Plastering Services, Carpentry Services cumulative profit curves





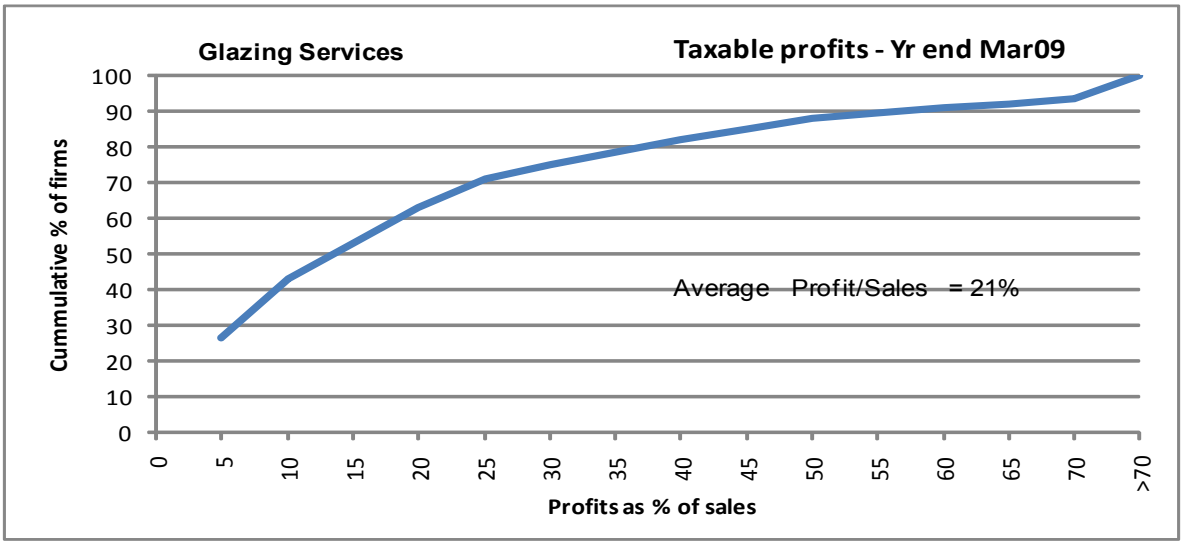


Figure 75. Tiling and Carpeting Services, Painting and Decorating, Glazing Services cumulative profit curves

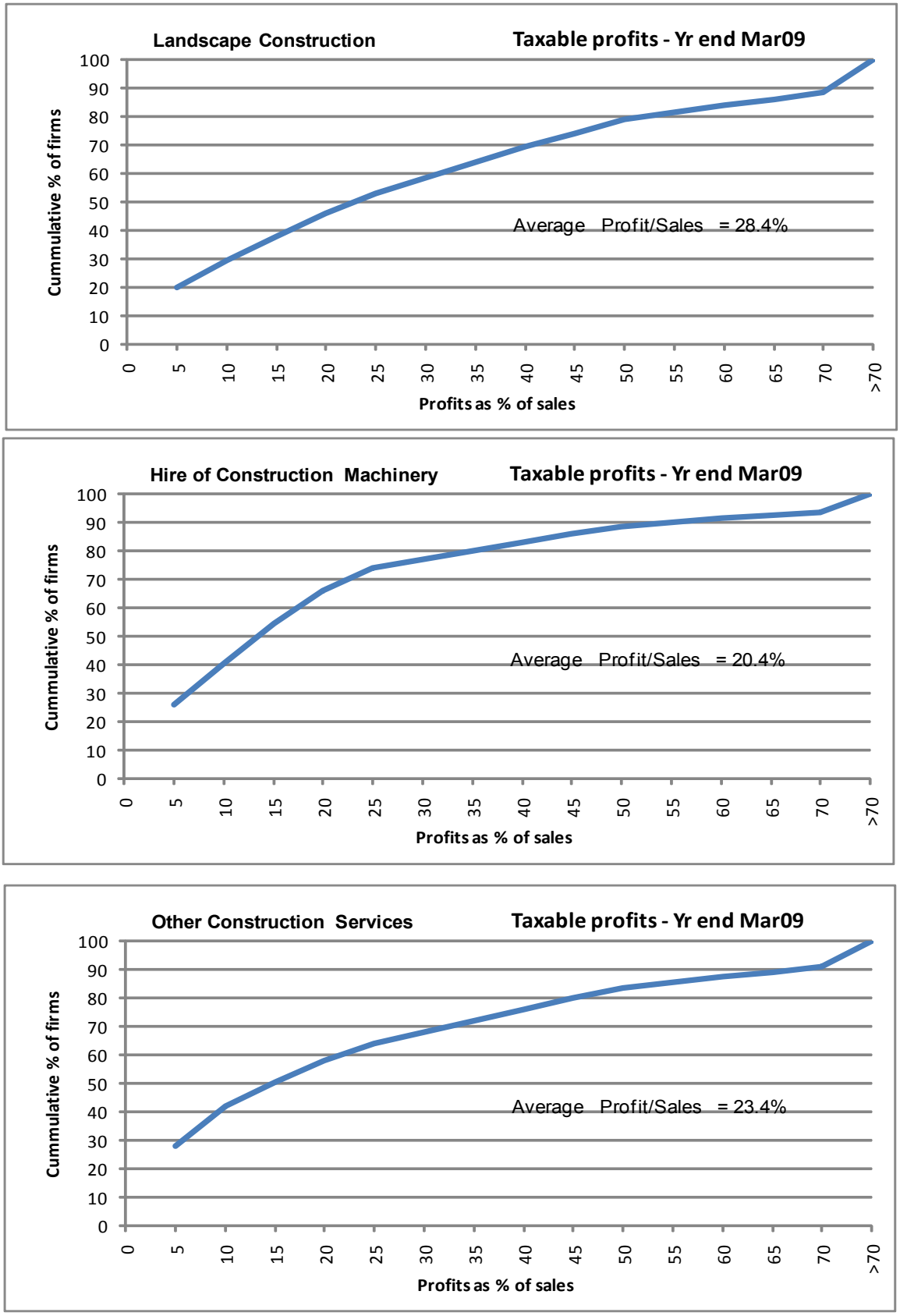


Figure 76. Landscaping, Plant Hire, Other Construction Services cumulative profit curves

9.2.4 Summary statistics at sub-industry level

Table 1 below shows summary statistics for each sub-industry. The third column is the ratio of average to median profits and gives an indication of skew in the profit distributions. The median value is the middle value when all the firms are ranked according to profit percentage.

The ratio of average to median profit shows that non-residential buildings and air conditioning industries have the most skew. They also have the highest ratios of standard deviation to profit ratio. The reason for this, in the case of non-residential buildings, is there is a wide variety of building types and hence sub-markets within the sector. For the air-conditioning sub-industry it may represent the inclusion of both home ventilation systems at the low cost end and large-scale HVAC systems in multi-storey buildings at the upper cost end.

The smaller ratios occur for the bricklaying, carpentry, tiling/carpet, and painting/decorating sub-industries. These are sub-industries having high profit margins, but as individual sub-industries are fairly homogeneous and have little differentiation of their services.

Table 1. Sub-industry statistics

Sub-industry Statistics - profitratios, productivity and persons engaged.							
	Average profit as % sales	Median profit %	Ratio Ave to median profit	Std Dev Profit%	Ratio Std Dev to Ave Profit	Labour productivity $000/person	Ave persons engaged
House Construction	29.8	21.9	1.36	24.6	0.83	63.1	1.67
Other Residential Building Const	34.0	27.7	1.23	26.0	0.76	57.5	1.37
Non-Residential Building Const	23.7	11.1	2.13	24.0	1.01	97.3	7.64
Road and Bridge Construction	16.1	10.5	1.54	15.4	0.96	104.2	20.26
Other Heavy and Civil Engineering	22.3	12.7	1.76	21.3	0.95	88.7	12.40
Land Development and Subdivision	33.0	26.7	1.24	24.1	0.73	90.6	1.25
Site Preparation Services	18.9	11.8	1.60	17.7	0.94	94.8	3.66
Concreting Services	23.8	15.6	1.52	20.0	0.84	71.3	2.89
Bricklaying Services	34.4	33.4	1.03	23.1	0.67	50.3	2.22
Roofing Services	24.7	14.0	1.76	22.9	0.93	63.9	2.71
Structural Steel Erection Services	45.9	34.8	1.32	35.0	0.76	72.9	2.73
Plumbing Services	21.2	13.8	1.53	18.3	0.86	65.0	2.62
Electrical Services	26.7	19.5	1.37	21.6	0.81	62.1	3.03
Air Conditioning & Heating Services	17.0	8.2	2.08	19.9	1.17	77.5	4.59
Fire& Security Alarm Install Serv.	20.7	11.7	1.78	19.7	0.95	65.4	5.61
Other Building Installation Services	22.9	13.2	1.74	21.5	0.94	65.3	3.72
Plastering and Ceiling Services	35.0	30.7	1.14	24.8	0.71	52.3	1.94
Carpentry Services	40.9	39.2	1.04	24.9	0.61	52.3	1.84
Tiling and Carpeting Services	35.1	33.5	1.05	24.4	0.70	53.3	1.81
Painting and Decorating Services	38.1	36.7	1.04	23.5	0.62	49.6	2.27
Glazing Services	21.0	13.4	1.56	18.9	0.90	63.4	3.06
Landscape Construction Services	28.4	22.8	1.25	21.0	0.74	54.6	2.58
Hire of Construction Machinery	20.4	13.3	1.53	18.6	0.91	102.8	4.38
Other Construction Services n.e.c.	23.4	14.5	1.61	21.1	0.90	70.4	3.55