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1 Executive Summary

1 This sector competitiveness analysis (SCA) provides a snapshot of the competitiveness of the UK leisure boatbuilding sector and sets out how the leading UK manufacturers compare with their leading international competitors.

2 The scope of the study included the luxury powerboat sector of boats between 25 feet and 125 feet in overall length. The four leading UK builders reviewed are Sunseeker, Princess Yachts, Fairline and Sealine who between them account for over 80% of the UK sector. The business model for the UK companies is relatively standard with an almost exclusive focus on a single brand and an employed workforce. The UK companies employ over 4,500 people with an 8% increase in jobs in 2004.

3 The major international competitors are identified as the Ferretti, Pershing and Azimut brands in Italy, and the Sea Ray brand in the USA. The business models for these are very different with the individual brands being part of corporate structures marketing a number of different brands combined with non-boatbuilding activities. The Italian model is also more heavily based on a flexible labour model with a major element of sub-contract labour. The methodology for the study detailed is in Section 3 and has been structured on a brand related basis to provide a focus solely on the boatbuilding activities of these corporations and to provide comparable measures with the UK companies.

4 An overview of the market position based on published market data and the type and size of products produced by the different brands is summarised in Section 4. The boats in the scope of the project range in retail price from $85,000 to over $14 million.

5 The comparative Value Added productivity for the brands are analysed in Section 5 and summarised in Table 1.

Brand	Country	Value Added per FTEE in $	% of average
Ferretti	Italy	103,600	140
Pershing	Italy	91,248	124
Azimut	Italy	83,690	113
Sea Ray	USA	78,969	107
UK 1	UK	59,985	81
UK 2	UK	59,376	80
UK 3	UK	57,697	78
UK 4	UK	55,549	75

Table 1: Relative boat builder performance.

Table notes.
(a) Value added is taken as revenue less the cost of bought in goods and services
(b) FTEE is full time employees plus sub-contract labour

6 The SCA finding is that UK companies create significantly less Value Added per FTEE. The weighted average for Value Added per FTEE for the sample as a whole is close to

$72,500 and indicates a level of Value Added productivity that is comparable with the European average for the automotive and aerospace sectors.

7 The average size of boat produced by the different brands ranges from about 36 to 61 feet in overall length, and from 7 to 30 tonnes measured by dry weight. It is very important in productivity studies like this that like is compared with like. The analysis of declared boat weights and lengths in Section 3.4 shows there is a relationship between the boat length and the boat weight that indicates that the weight per unit of volume is relatively constant for all boat sizes. This strongly indicates that material intensity is relatively standard across all boat sizes.

8 A review of the price lists for the different brands in Section 6.2 shows that all brands charge more per tonne as the size of the boat increases. This would support the hypothesis that a major reason for the higher Value Added productivity of the Italian brands is that they produce larger size boats, which support a higher price per tonne when the material intensity is relatively the same. Indeed, there is a correlation co-efficient of 0.73 (where 1.0 shows a perfect relationship) between the average weight of boat produced by the different brands and the Value Added per FTEE results as shown in Table 1.

9 However, analysis of the cost of materials used by the different brands in Section 6 shows that these also increase as the size of the boat increases, and in fact do so at a faster rate than the price supported by the market. This suggests that there are changes in the functionality or quality of materials to support the higher prices, although the materials intensity is the same.

10 The overall impact of these different rates of increase in price and the cost of materials as the boat sizes rise, is that the actual Value Added per tonne decreases as boats get larger, based on a standardised output. The relationship is detailed in the Typical Cost Structure model in Section 6.6, which also includes labour costs, with the key messages shown in Table 2. This shows that where the average weight of a boat increases by 100%, the revenue generated increase faster by 122%, but Value Added only increases by 57% because of the even faster increase in the cost of bought-in goods and services.

	Sample boat 1	**Sample boat 2**	**% change**
Average length of boat (LOA)	45 feet	59 feet	+31%
Average weight of boat (tonnes)	13.1	26.2	+100%
Revenue generated	$ 589,881	$ 1,327,249	+125%
Value Added	$ 277,368	$ 434,896	+57%

Table 2: Value Added by boat size.

11 This suggests that the average boat size is a significant factor, but not a full explanation of the Value Added differences.

12 To understand further the differences in overall value productivity for the different brands, three main areas have been examined in Section 6 based on an analysis of output defined as the average gross weight of boats produced. The first two focus on the use of materials and labour in the production of the boats with these two areas accounting for 60-70% of the total brand revenues. The detailed results indicate that as boat weights

increase, the cost of materials per tonne increases reflecting changes in functionality and quality, as does the direct labour requirement for production. An index has been developed showing the efficiency of the sample brands allowing for the differences in average boat weights.

13 The third area is 'price productivity'. Overall, larger boats support an increased price per tonne, but some brands appear to achieve premium prices and this is shown by the Price Productivity Index.

- The results for the three areas are summarised in Table 3.

Brand	Country	Materials efficiency index	Direct labour efficiency index	Price productivity index
Ferretti	Italy	98	87	124
Pershing	Italy	69	107	123
Azimut	Italy	121	114	100
Sea Ray	USA	n.a.	117	93
UK 1	UK	92	74	91
UK 2	UK	89	97	75
UK 3	UK	124	120	77
UK 4	UK	97	77	93

Table 3: Labour, materials and price efficiency by boat builder.

Table notes.
(a) The UK companies are not identified by the same number in the tables in this Executive Summary to maintain confidentiality of information

14 A key message from this table is that the findings on materials and labour do not show significant differences between the national industries.

15 On production efficiencies covering materials and direct labour, the UK 3 brand is most efficient closely followed by Azimut. In contrast, Pershing would appear to spend significantly more than average on materials, whereas Azimut which has a similar average weight of boat output appears to spend significantly less. There are also significant variations between the UK companies on these two measures.

16 The pricing index provides a different result with the Ferretti and Pershing brands generating a premium price for their output in excess of 20%. This is not necessarily an 'Italian premium' because Azimut only achieves average prices on overall output. This premium price is independent of the average weight of boat produced and is a measure of the brand value, functionality and quality of the product offered to customers.

17 The scope of the study did not include any specific customer research to help understand the ability of certain brands to achieve price premiums but interviews have been held with a sample of suppliers, dealers and industry commentators. This sample cannot be taken as fully representative but the consensus view was that the Italian brands' ability to

deliver higher revenue levels is driven by innovation in design and the quality of equipment, and a better understanding of the customer HNWI (high net worth individuals) market. A suggested approach to evaluating this view is shown in Appendix D.

18 Section 7 reviews the impact of innovation, skills and investment on the three indices shown in Table 3 as well as Value Added and Net Value Added. Overall the sector is R&D intensive with an average spend of about 2.6% of revenue on research and development activities. Specific data on the level of R & D spend in Italian companies is not clear, but the available information suggests that it is no higher than in the UK, and both countries' brands invest significantly more than Sea Ray in the States.

19 UK companies would appear to be at the same level of the adoption of lean manufacturing processes as the Italians and the evidence indicates that stronger ratings are associated with improved labour productivity. However with current leading practice in the automotive sector rated at 10, the best score on any of the criteria for measuring lean for UK boat builders is 5 and the majority of results are significantly lower than this.

20 On the use of technology, the Italian sector, and particularly Azimut, would appear to be leading the UK – particularly on resin infusion, robotics and CNC tool making. The overall leader on resin infusion and robotics is Sea Ray but at present the use of the technology is limited to smaller boats outside the scope of this study, but investment plans are in place to extend usage into this segment by 2008. Again the indication is that higher technology usage ratings correlate with lower labour costs, but the relationship is not yet strong.

21 Similarly, Azimut's more advanced technology appears to have the benefit of greater materials efficiency. However, this finding is only indicative because the technology is focused on hull production, and resin and GRP account for only around 10% of total material costs. Overall, the correlation between technology levels and materials efficiency ratings is low at 0.36, but this increases to a strong relationship of 0.9 if the anomalous results of one UK company are excluded.

22 The Italian sector has a higher level of capital intensity than the UK and significantly higher levels of capital expenditure in the last few years. All the manufacturing plants at Ferretti, Pershing and Azimut have been subject to major investment and upgrading in the last two years. This is in part driven by the fact that both are majority owned by finance companies said to be looking to mount successful IPOs, probably within the next 2 to 3 years.

23 Overall there is no strong evidence that ownership structures impact competitiveness. The one UK company which is family owned showed a significantly above average investment intensity in 2004. The two brands in the sample owned by a public corporation showed investment intensities at or below the average for the whole sample.

24 A number of the brands in all three countries reviewed have received state aid in the recent past to support investment in facilities and job creation. This was not a prime area of focus and the study has not identified any evidence that differences in the levels of support have been sufficient to impact overall competitiveness.

25 The industry supply chains in the UK and Italy are essentially the same in structure and can be divided into two segments: multi-national companies particularly in engines and drive lines, electronics, electrical equipment and GRP and resin who are increasingly moving to pan-European pricing structures; and local companies more focused on wood products, furnishings, upholstery and consumables. The major differences are the larger scale of the boat industry in Italy which supports more suppliers giving more choice to builders, and the sub-contract labour business model which gives manufacturers greater labour flexibility but is changing in response to the scale of manufacturing, the increasing use of technology and modifications to employment regulations.

26 The growth rates of the UK industry in terms of both revenues and job creation indicate that competitiveness in terms of market share against the identified Italian and American brands is being maintained.

27 However there would appear to be significant opportunities for the UK sector as a whole to increase both Value Added and financial returns through:

- Increasing revenue per unit output through pricing reviews, stronger 'customer ownership' and customer relationship management, and improved market and brand value understanding;
- Improved direct labour efficiency through the increased use of lean processes;
- And improved materials efficiencies through the selective adoption of technology.

2 Study objective and scope

2.1 Overall study objective

The overall objective of this sector competitiveness analysis (SCA) is to assess and analyse the United Kingdom's competitiveness in the leisure boatbuilding industry. The SCA has been completed in line with KPMG's proposal document dated 10 December 2004 and confirmed by the contract ("The Contract") agreed with the DTI dated 25 February 2005 under purchase order 14021583. Specifically the SCA aims to:

- Estimate the size of the defined sector of boat building and its supply chain – see Section 4
- Identify the key factors affecting competitiveness and productivity and develop key indicators to benchmark comparative performance – see sections 5 to 7
- Compare boat production strategies and approaches between UK and other manufacturers – see Section 6
- Investigate whether financial constraints hamper needed investment by British firms – see Section 7
- Develop an understanding of the role of innovation and R&D in determining competitive advantage – see Section 7
- Develop an understanding of the competitiveness of the supply chain and interdependency on the leisure boat sector, and the impact of skills shortages – see Section 7

2.2 Study scope

The original scope of this SCA was to focus on the competitiveness of one sub-sector of the industry, boats with a length between 5 and 30 metres, with specific reference to the four leading UK manufacturers and their closest international competitors. For the UK, this sample covered the Fairline, Princess Yachts, Sea Line and Sunseeker companies. These companies exclusively manufacture and market leisure motorboats with overall lengths from 26 feet to about 125 feet through dealerships, and together account for over 80% of UK production. The major international competitors, as identified by the UK companies, covered the Ferretti Group and Azimut-Benetti in Italy together with Sea Ray in the USA.

The Ferretti and the Azimut-Benetti Groups both manufacture a wide range of leisure boats ranging from small fishing and sports boats through to mega-yachts in excess of 100 metres in length, but under a number of different brand names. For the purposes of this SCA, the most comparative brands are Ferretti and Pershing in the Ferretti Group, and the Azimut brand in the Azimut-Benetti Group. The American Sea Ray brand makes boats from 18 to 68 feet in overall length, but for this study only those parts of their operation identified as involved in boat building between 36 and 68 feet have been included. The Italian brands together claim a market share in excess of 35% of national

production, and Sea Ray has a US market share of about 30% of the segment under review.

In summary, the scope of the SCA covers a comparison of competitiveness of the eight leading international brands in the powerboat product segment between 26 feet and 125 feet in overall length.

2.3 Profile of the brands

The number of companies included in the study is small and they have very different ownership and organisational structures. This created complications in the availability and comparability of data as detailed in Section 3 under Research Methodology. A profile of each of the 8 brands is shown in Table 4.

Sunseeker International Ltd *UK*	Sunseeker is a privately owned company. All boats are sold under the Sunseeker brand.
Princess Yachts International Ltd *UK*	Princess is owned by the Renwick Group. Motorboats are marketed under both the Princess brand and as own label products in the USA and during the study period, the company built and marketed Moody sailing yachts.
Fairline Boats Ltd *UK*	Fairline was owned by the Renwick Group for the period covered by this study but in June 2005 was subject to an MBO supported by 3i. All products are sold under the Fairline brand.
Sealine Ltd *UK*	Sealine is a subsidiary of the Brunswick Corporation (USA). All products are sold under the Sealine brand and the company owns and operates a number of dealerships in Europe.
Ferretti Yachts SpA *Italy*	Ferretti is a division of the Ferretti Group, and Ferretti Yachts SpA is classified by the Group as a commercial/real estate company with an asset intensive balance sheet. The Ferretti yacht brand makes up about 40% of total Group sales. The main shareholder in the Ferretti Group is the Permira private equity company. The Ferretti Group has a number of centralised service providers including engineering, hulls and joinery, and the operating companies use sub-contract labour business models.
Pershing SpA *Italy*	Pershing is classified as an operational company within the Ferretti Group accounting for about 20% of Group sales.
Azimut *Italy*	Azimut is an operational brand within the Azimut-Benetti Group accounting for about 55% of Group sales. The Group is less centralised than Ferretti but the operating brands also work with the sub-contract labour business models The main shareholder in the Azimut-Benetti Group is the San Paolo IMI Bank.
Sea Ray Boats *USA*	Sea Ray is a division within the Boat Segment of the Brunswick Corporation and accounts for about 50% of Boat Segment sales. Brunswick Corporation is an integrated industry supplier with a separate Marine Division manufacturing engines and electronic equipment. The Sea Ray division markets the brands of Sea Ray, Baja and Boston Whaler. The Sea Ray brand product range covers boat lengths of 18 feet to 68 feet, with the smaller boats under 36 feet outside the scope of this study.

Table 4: Profiles of the leading boat builders.

2.4 Competitiveness measures

The analysis of competitiveness contained within this report is defined along three axes which are:

- Outputs – This covers key performance indicators such as turnover, volume of production and Value Added
- Inputs – This covers the cost of inputs to boat builders including bought in goods and services, employment, technology and capital
- Efficiency – This examines measures of how efficiently inputs are used, primarily by comparing inputs against outputs for the different brands.

To give "breadth" and "depth" to the comparisons, a range of measures of productivity and efficiency have been used at different points in the report including:

- Economic measures – based mainly on Value Added and Net Value Added
- Financial measures – including Return on Sales and Return on Total Assets
- Manufacturing measures – including for example direct man hours per unit of output, thee use of lean processes and the use of production technologies.

3 Research methodology

3.1 Aims of the research methodology

The research methodology was developed to meet the study objectives and scope and to enable the comparison of the relative competitiveness of the different brands of leisure boats.

3.2 Special features

In the development of a methodology we needed to take account of three key issues to deliver an effective analysis of the levels of competitiveness and the drivers of the differences. These were:

- The fact that some of the brands are part of larger diverse organisations with no clear separation of organisational or financial structures. The basic information required for the SCA is not available in many cases through standard financial reports or published company analyses: for example the size of the workforce including sub-contract labour and sales of different sizes of boats. Similarly, the production of boats within the scope of the study is limited in some companies to some of the manufacturing plants[1], and this needs to be identified and incorporated into the analysis.
- The depth and breadth of information required on inputs to develop the correlation with outputs wherever possible. An example is employment costs. Although these are reported in total in financial accounts for European companies, but not so identified in American accounts, the level of analysis requires a split between direct and indirect workers, and for direct workers a further level of analysis into hours worked and the cost per hour.
- And the differences in timescales of existing published information. Available financial accounts from Italy were for 2003. USA and UK accounts were available for financial years ending in 2004, but with different year ends. Similarly, operational and management information was available for differing periods across the companies and the methodology needed to assess and allow for any changes in the business environment over these periods to ensure as like-for-like a comparison as is possible. This was done during the analysis framework as shown in Section 3.4.

3.3 Information sources

Primary data was collected through a programme of interviews with executives at the individual boat builders, field visits to manufacturing plants where possible, supported by secondary research of public domain data. With the sponsorship of the British Marine

[1] For example, Sea Ray in the USA manufactures in 6 plants in Tennessee and Florida, but only 3 of these build boats in the size range within the scope of this project. Information on the employment and output of these plants had to be identified separately from overall corporate information

Federation, field visits were made to each of the four UK companies. With both the Italian and US companies, field visits to manufacturing sites were not possible and information is based on the interview programme, published company information and secondary sources.

3.3.1 Field visits and interview programme

3.3.1.1 *Boat builders*

A field visit was made to each of the UK motorboat manufacturers and a structured interview framework used to draw out performance and organisational data in the following business functions:

- Strategy and General management – including the objectives of the company and proposed strategies for the future
- Sales and Marketing – including product sales, the channels to market, targeted brand positioning, sales resources, publicity activities and assessment of competitors
- Human Resources and Personnel – including people policies and resource levels, skills development
- Operations and Procurement – including manufacturing strategy, overview process analysis, stock levels, technology usage and ambitions
- Research and Development – including levels of spend and broad direction of investment
- Finance –management accounts and financial objectives and policies

Executives representing each of these business functions were interviewed and a factory tour was taken to witness and corroborate the results of the interviews.

This primary data was compared for internal consistency and across the different manufacturers, supplemented with desk based research from a number of different sources. Where possible, similar information was developed for the non-UK manufacturers from published information and similar comparisons were made. The combined data set was reviewed and productivity measures were determined for each manufacturer, which were then used to assess the level of productivity of the UK industry by comparing the measures to data from boat builders from other countries.

3.3.1.2 *Suppliers*

Suppliers from various product categories were questioned through a structured telephone interview to understand their views on the boat builders, the market and its risks and to corroborate data from the boat builders from a different position in the supply chain.

3.3.1.3 *Retailers*

A number of retail dealerships were interviewed, both over the telephone and face-to-face to get their views on the market, product types and trends and general industry dynamics.

In total, approximately 60 individuals were interviewed in 30 different companies and organisations in the UK, Italy and USA.

3.3.2 Secondary data sources

Additional data for UK, American and Italian companies has been obtained from published company information and market research reports together with interviews with suppliers, boat dealerships, industry consultants and key industry players.

The generic sources are referenced throughout this report, with references to specific sources as appropriate and are illustrated in Table 5.

Primary research
defined as company provided data in any form including
• Data sheets provided to the project team by the UK survey participants
• Public domain data including price lists, brochures, web-sites, accounts, company reports
Secondary research
defined as data and information from a wide variety of sources including
• Market research reports from public and private sources
• Newspaper and magazine articles
• Interviews with industry players in the boatbuilding companies, dealerships, supply chain companies and informed industry advisers
Research based data
defined as information derived from research findings and compared with other sources
• An example is the 'direct labour cost per hour' at Pershing. Research data shows a cost of €19 an hour at Azimut. Audited accounts show the per employee cost at Pershing is 75% of that at Azimut. The working assumption then is that the direct labour cost per hour will be 75% of that at Azimut with a similar number of working hours.
Group level data sources
• The Azimut and Sea Ray brands are sub-sets of larger corporations. Some data sets are not available at below group level and so group level data has been used where this does not appear to conflict with specific brand information available through other sources. An example would be the total spend on R&D within Sea Ray. This data is available only at "Boat Segment" or division level within the Brunswick Corporation. The assumption is that allocation of R&D within the boat segment is proportional to the relative sales of the brands

Table 5: Information sources.

3.4 The analysis framework

The approach to measuring productivity in this study has been largely shaped by the availability of data. Sectoral productivity studies which can draw on official data on measures of outputs and a range of inputs for a large number of production units or firms

are typically focused on the econometric estimation of recognised measures such as total factor productivity or average labour productivity.[2]

This method was not feasible in this case due to the small number of economic organisations in the sample, the absence of official sectoral data, and the difficulty of getting all the company data that would be required. The approach pursued in this paper has been tailored to ensure the production of meaningful results given these data differences, and to be comprehensible to a general business and policy audience.

The data analysis framework has three stages:

1. Establish whether there are significant differences in productivity measured by Value Added[3] per employee across brands – see Section 5.2.

2. Determine the extent to which these arise

    - because some brands can charge a higher price because of differences in their products or markets – see Section 6.2,
    - or the efficiency with which inputs such as materials (Section 6.3), labour (Section 6.4) and capital (Section 6.6) are utilised.

3. Investigate the extent to which differences in stage 2 might be explained by differences in innovation, investment, skills, or the supply chain – see Section 7.

The focus of this approach is to explain productivity differences in terms of measurable differences in outputs as represented by physical characteristics, or inputs as represented by their costs.

The main limitations of this approach are that it is: (a) piecemeal, analysing factor by factor, (b) vulnerable to fluctuations and comparability problems in the data, (c) restricted to the examination of the correlation between the measures of productivity and output and the intensity with which various factors are applied in the production process.

Despite these limitations, this approach has the potential to explain the main facts which characterise the competitive environment, to identify those factors most closely related to productivity differences, and rule out those which are not, and thereby to suggest those areas on which future more detailed investigation should be focused.

The measures used at each of these stages are defined in more detail in Appendix B.

[2] The advantages of an econometric approach is that it can (a) assess the contribution to output or price of all factors simultaneously, (b) extract noise in the data resulting from e.g. some differences in accounting practices, the business cycle and random fluctuations, and (c) provide a rigorous basis to test hypotheses.
[3] According to the DTI, the maximisation of Value Added is a key government policy objective.

3.4.1 **Definitions**

Because of the structure of the industry, the different business models and the nature of information available from a multi-national sample set, certain terms have been specifically defined to allow effective comparisons across the different brands. The specific terms are:

3.4.1.1 ***Labour***

The unit of labour has been defined as a Full Time Equivalent Employee (FTEE). FTEE is the total number of equivalent full time employees *plus* the number of sub-contractors used at different parts of the value creation process[4]. The Italian boatbuilding business model uses sub-contract labour though the proportion is falling in response to increasing scale, technology change and evolving employment regulation. An illustrative model for sub-contracting, based on one of the Italian groups covered in this study, is detailed in Table 6 showing the proportion of work carried out by sub-contract labour at different stages of the manufacturing cycle.

Production activity	**% sub-contracted**
Design and engineering for manufacture	0
Tooling	50
Fibreglass hull	50
Components	75
Assembly	50
Finishing	0

Table 6: Italian sub-contract model.

Table notes:
(a) Source is KPMG research
(b) Model is based on Group labour policies and not individual brands

This model has been adjusted because it gives the picture for a Group as a whole and this study is focused on comparing competing brands. The Ferretti and Azimut-Benetti Group brands and Sea Ray are parts of larger corporations with centralised functions which are effectively outsourced or sub-contracted by the individual brands. This is not the case in the UK where the companies are individual entities.

[4] FTE (Full time Equivalent) is the typical taxonomy for employees. To account for the inclusion of subcontract labour, and differentiate the classification from FTE, FTEE has been used.

The use of the FTEE measure enables a more accurate comparison across the different business models, and the overall impact is shown in Table 7.

	Employees as a % of FTEEs	
	2003	**2004**
Ferretti	68	76
Pershing	52	53
Azimut	62	69
Sea Ray	91	91
UK 1	100	100
UK 2	100	100
UK 3	100	100
UK 4	100	100

Table 7: Total workforce sizing and sub-contract levels.

Table notes
(a) All brands outsource certain and differing functions and activities. However, the differences were not found to be have a material impact and therefore, apart from corporate and sub-contracting policies, FTEEs have been taken as employees

3.4.1.2 *Capital*

Total assets have been used as the baseline for capital productivity comparisons because this information is available for most of the brands. Other measures have been reviewed, for example return on capital employed where the data is available, but the dataset is smaller in these cases.

3.4.1.3 *Unit of output – dry weight in tonnes*

There is no standard unit of output for this sub-segment apart from the number of boats. Given that the smallest boat in the sample is 26 feet LOA[5] and priced at $85,000, and the largest is 125 feet LOA and priced nearly 200 times higher at $14 million, the number of boats is not an effective measure of output. Figure 1 shows that there is a clear correlation ($r^2 = 0.98$, where 1 = direct relationship) between the overall length of the boat and the dry weight[6] in tonnes across the whole range of sizes produced by the brands covered by this study.

What Figure 1 shows is that as the overall length of the boat increases, so does the dry weight, with the type of boat, for example flybridge or open cruiser, having little impact. However, the relationship is non-linear. This means that for a similar 10% increase in the length, the boat weight increases slightly less at the top end of the size range (c25%), compared with a smaller boat (c29%).

[5] Length overall (LOA)
[6] Dry weight is defined as the weight out of water of the hull, fixtures and fittings but excluding fuel and other liquids. The weights used in this study were as provided by companies either during field visits, and in some cases with revisions, or in sales literature.

The reason for this and the non-linearity of the total relationship is that boat shapes change as they get bigger – effectively they become longer and narrower. This is shown by the beam, or maximum width of the boat, as a percentage of the overall length. Over the range of boat lengths, the beam[7] falls from about 30% of the length to around 24%. Interestingly, the overall height of the boat ('depth' plus 'height above water') is relatively constant at around 40% of the length.

The impact of this change in shape is that the rate of increase of the volume of the boat slows with the larger sizes, explaining the same relationship already shown with weight.

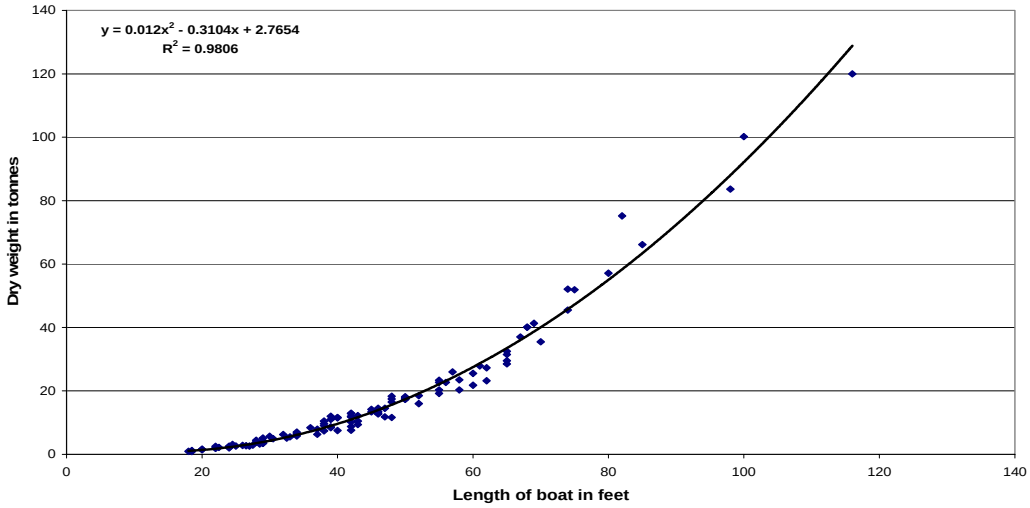

Figure 1: Relationship between boat length and boat weight.

Figure notes.
(a) The data is based on company information. (b) The sample set includes all brands except Ferretti, Pershing and Sunseeker (model specific data is not available), but includes Bayliner (Brunswick Corporation) for smaller boats

A conclusion from Figure 1 is that the boat weight per unit of volume is relatively constant across the size range included in this study. As weight is driven by materials, this suggests that material intensity is also relatively constant across the size range.

It is very important in productivity measurement that like is compared with like. Boats differ according to their physical attributes, of which the most important is size (measured either by weight or length), since all other physical attributes and price increase with size (although not necessarily linearly or to the same extent for different brands). For this reason, the analysis of pricing and input efficiency in this study is always conducted for a given size class, where the dry weight of the boats produced is used as the base measure of output.

[7] The specific figures are from the Fairline and Ferretti brands, but the relationship is common across the whole sample.

3.4.2 International comparisons

All financial comparison data in this report has been expressed in US dollars.

These comparisons are subject to the caveats normal to this form of analysis, being:

- The difference in timings for the availability of data. The US data is primarily for the calendar year ending in December 2004. The UK data is based on financial years ending either in July or December 2004, and the detailed Italian data is based on the calendar year ending in December 2003.
- Changes in currency rates.

The exchange rates used for this report were taken at June 2nd 2005. Table 8 shows the comparison between this rate and the average rates for 2004 and 2003.

Exchange rates	Rate at June 2nd 2005	Average rate for 2004	Average rate for 2003	Potential error in Value Added comparisons
€ to USD	1.22	n.a.	1.13	+ 7.3%
£ to USD	1.81	1.83	n.a.	-1.3%

Table 8: Exchange rates.

The final column shows the potential error that may be created in the calculations of Value Added for the Italian and UK companies in comparison with Sea Ray. The values for the Italian companies may be overstated by just over 7%, and UK values understated by just over 1%. However, these differences are not seen as material given the much larger calculated differences in the actual comparisons.

3.5 Presentation of data and caveats

Detailed information, much of it commercially confidential, has been supplied by the four UK based companies with confidentiality agreements signed between two companies and KPMG. For the UK companies, only public domain information is specifically attributed to individual companies.

Where specific company information needs to be referred to, the data has been presented in the following format.

Company identifier	Interpretation
UK 1	Company based in the UK
UK 2	Company based in the UK
UK 3	Company based in the UK
UK 4	Company based in the UK

Table 9: Data presentation.

The company number has been changed for each different data set so comparisons cannot be drawn between, for example, UK 1 across all data sets.

Information on Italian and American brands and companies has been presented with company identification.

There are two concerns with the Italian data:

- The detailed operating and financial data is mostly for 2003, with some from 2004 and 2005, whereas UK and USA data is for 2004. There may have been change during this period but the brand growth rates have been comparable and our assessment is that no material change will have developed;
- The different business model based on sub-contracted labour accounting for up to 50% of the total FTEEs. This makes the estimates of the scale of the use of sub-contract labour critical to the overall assessments and KPMG estimates have been made based on information from a number of industry sources.

With the American data, the main concern is that relevant product range is built at only some of the plants and is not a separate business unit within Sea Ray, and therefore little official company information is available. Much of the detail is from non-corporate sources and has been developed on a plant-by-plant basis.

The overall concern is with the robustness and comparability of the data from all sources. Because of the differences between the different brands in the study - some are part of corporate groups, some are single activity companies and some have multiple businesses, some allowed field visits, some did not – the number and nature of information sources varies significantly across the sample set, as do the timescales for which information is available.

The data we have presented in the different tables and figures in this report is, we believe, on a like-for-like basis as far as possible, but in all cases should be treated as approximations. Conclusions have been developed only where there are materially significant differences between the results from different companies.

4 The luxury boatbuilding market

This section presents a top level summary of the market in which the eight brands operate. The information is drawn from published sources with added comments from our interview programme with suppliers and dealerships.

The main findings are that the market is growing and there is a trend towards larger boats. Survey respondents expressed the view that Italian manufacturers also lead in product innovation and the use of technology, and these views are tested in detail in Sections 6 and 7.

4.1 Market overview

Classification of the boating market can be complex because of the many different ways in which boats are considered. The most common methods of motorboat classification are by *length* - generally in feet, by *engine position* – inboard or outboard, by *hull type* - rigid or inflatable, fibreglass or metal, by *use type* - cruiser, sport, or fishing etc. and even by *style* - flybridge or open. An additional classification is used within the industry that segments the market by a *length category* – large yacht, super yacht or mega yacht.

This report was originally specified to consider motorboats that have inboard engines, are between 5 metres and 30 metres (approx 14' to 87') overall length (LOA), have fibreglass hulls, are for pleasure or leisure boating and because of their high levels of specification and appointment, are generally considered to be luxury motorboats. The scope has been modified to cover the 26' to 125' range. These motorboats span the large and super yacht segments with some penetration into the mega yacht segment. The mega yacht segment is not covered specifically by this report because it brings in another competitive set; those manufacturers who operate in the ship building segment.

Table 10 shows the key motorboat manufacturers within this classification.

Collectively, these manufacturers produce a variety of motorboat types and styles and offer over 130 different models[8]. The largest manufacturer by turnover, Sea Ray, and UK based Sealine, are both companies of the Brunswick Group which is based in the US, which, along with Rodriguez Group and Beneteau S.A., both of France, is one of only three publicly quoted luxury motorboat manufacturers that operate in the UK. All the other companies are privately owned and financed. For the period under review, Princess Yachts International Ltd. and Fairline Boats Ltd. were also owned by the same parent company, although Fairline Boats had announced its intention to proceed with a venture capital backed management buy-out.

[8] Source: Manufacturer websites, published market research and company data.

Manufacturer	Manufacturing Location	Sales (2004) in $ million
Brunswick Group Boat Segment *of which*		2,271
- Sea Ray *(h)*	USA	448[9]
- Sealine Ltd. *(a)*	UK	111
Genmar Group *of which*		1,000
- Carver Yachts *(h)*	USA	200
Ferretti Group *of which*		692
- Ferretti Yachts *(e)*	Italy	226
- Pershing S.p.A *(h)*	Italy	106
Azimut Benetti Group *of which*		565
- Azimut *(d)(g)*	Italy	312
Sunseeker International Ltd. *(a)*	UK	255
Princess Yachts International Ltd.*(a)*	UK	195
Rodriguez Group *(c)*	Spain and Italy (HQ in France)	192
Fairline Boats Ltd. *(a)*	UK	142
Cantiere Nautico Cranchi *(b)*	Italy	100
Couach *(f)*	France	59

Table 10: Key players in the luxury motorboat building industry.

Table Notes: *(a) Data from published accounts, 2003. (b) Data from Amadeus (2003). (c) Data from Rodriguez Group annual report. (d) Data from Azimut website. (e) Data from Ferretti Group annual report. 2004 estimate. (f) Data from Couach (formerly Guy Couach) website. (g) Azimut sales value is "value of production", (h) KPMG estimate for sales in scope.*

While all these manufacturers produce similar products and operate in similar market segments, Rodriguez Group positions itself clearly as a leader in very large, custom motorboats and as such, its product range is partly in the mega yacht category, which this report does not address. Rodriguez Group does have significant presence in the large and super yacht segments though (below 130' LOA) that delivered 49% of its revenues in 2003[10].

For the most part, the luxury motorboat manufacturing industry is concentrated in the UK, Italy, France and the US. However, the key manufacturers included in this SCA only account for a proportion of the global market. An analysis of Standard Industry Classification (SIC) codes reveals that in the UK there are 164 companies that undertake business captured under UK SIC code 35120 – *Building and repairing of pleasure and sporting boats,* and US SIC code 3732 – *Boat building and repairing.*[11] Clearly not all of these companies are participating in the luxury segment but it does provide an indication of the makeup of the UK industry, the number of players and therefore its level of maturity. The SIC code analysis also highlights the prevalence of privately owned companies with only 12 companies publicly quoted. By comparison to some other

[9] Sales figure is for estimated sales of boats in the size range of 36 to 68 feet OAL
[10] Source: Rodriguez Group 2003 annual report.
[11] Source: OneSource.

industries, the luxury motorboat manufacturing industry appears to be relatively immature with 50% of the UK manufacturers still owned and/or managed by their original founders. This in itself is not an issue but does provide an interesting contrast to foreign, competitor builders that are owned by larger more affluent organisations. Ownership structure may present advantages when considering raising finance and also in gaining scale and efficiency advantages by using parent company business systems and processes, and ultimately may affect the organisation's level of competitiveness.

The luxury motorboat market is a developing market with what appears to be a growing client base. There is no monopoly supplier and currently the market appears to be profitable overall. As markets mature they generally start to segment, so this market may segment further in the future into segments such as value for money, power, technical performance etc. New manufacturers from other countries have already entered the industry, particularly from Germany (Bavaria Yachts), Turkey (Viking Marin and Numarine), Slovenia and Taiwan. These players may be a step towards increased competition and further market segmentation.

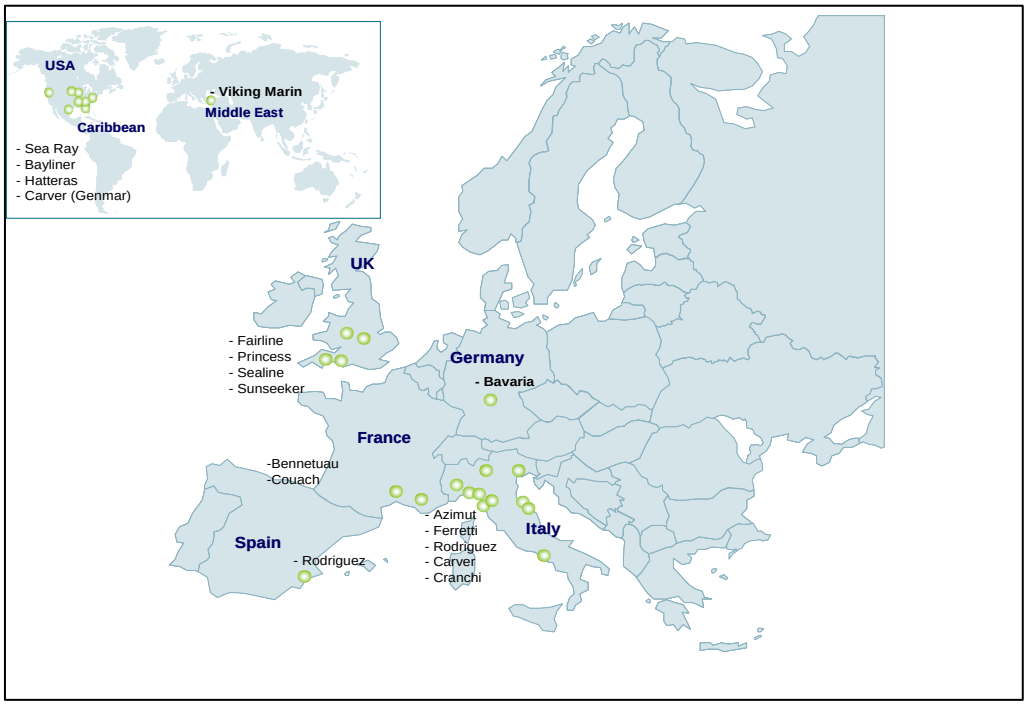

Figure 2: Location map of the key luxury motorboat manufacturers' shipyards.

In addition to the new entrants mentioned above, existing manufacturers including Rodman Polyships (Spain) and Jenneau (France) have recently announced significant extensions or restructuring of their manufacturing facilities to increase supply.

Very limited data exists that sizes the market for luxury motorboats. Overall, the four UK companies account for about 90% of UK production in this boat segment. Ferretti Group

and Azimut-Benetti between them account for about 36% of relevant Italian production, and Sea Ray about 30% of US production in the segment.

Industry participants[12] found it very difficult to size their market due to the fragmented and mobile nature of the customer base (i.e. the mobile nature of the customer base make it difficult to estimate where products end up) and also to the limited amount of available consolidated market data on this particular segment. Taking the key manufacturers under discussion and calculating the market size from stated turnovers/production values and export values etc. Table 11 estimates the size of the luxury motorboat market created by the manufacturers discussed in this report.

	UK	Italy	USA	France	Other EU	Other	Total
Unit volume sold in country*(a)*	227	233	3,129	114	542	441	**4,686**
Average selling price*(b)*	$826k	$2,282k	$536k	$911k	$826k	$826k	
Market value*(c)*	$187m	$532m	$1,678m	$104m	$448m	$364m	**$3,314m**

Table 11: Relative market size of the luxury motorboat market.

Table notes: *(a) Sales volumes have been used where available. Where sales volumes are not available, the production volume has been used, (b) Average selling prices have been calculated by taking the current published recommended prices calculating the average price of the product range, and weighting it by the latest year's sales or production volume. Where a price list is unavailable for a particular region, the UK weighted average price has been used, (c) Market values have been calculated by multiplying the unit volume by average selling price.*

These manufacturers produced around 4,600 units for worldwide consumption and generated a market value of around $3.3 billion. On this basis, Italy and the UK have around the same market size, by volume, but the Italian market value is more than double, due to the calculated average selling price being nearly three times that of the UK. This makes sense because the Italian manufacturers on average produce larger, more expensive motorboats. The US has the largest market both by value and volume and is made up of predominantly smaller craft. Hence the weighted average selling price is considerably lower in the US than in any other country.

The NMMA[13] (National Marine Manufacturers' Association) estimate that the total inboard cruiser market in the US (of which the luxury sector under consideration in this report is a sub sector) was worth around $3.3 billion and 8,600 units in 2004. Indicative market shares of the US market, for the manufacturers featured in this report are therefore derived in Table 12.

[12] Source: Interview programme.
[13] Source: NMMA 2004 Recreational Boating Statistical Abstract, May 2005.

	UK	Italy	USA	France	Other	Total
Volume	~1.3%	~1.1%	~30%	<1%	~45%	8,600

Table 12: Market volume shares for the US leisure motorboat market.

The US manufacturers dominate the US luxury motorboat market with export volumes from the UK manufacturers ranging from 5% to 25% of total output. However, these are still small export volumes in comparison to the overall US market size. The majority of product in the US comes from other US based manufacturers who are not featured in this report because they are not seen by the UK companies as significant competitors.

Exports appear to account for a significant proportion of overall sales for all the European manufacturers featured in this report. According to trade statistics from the United Nations (HS code 890392 - Motorboats excluding outboard motors and inflatable vessels) the motorboat industry supports an estimated $2.8 billion export market from the countries highlighted.

Exporting Country	Export Value 2003 $ 000's
Italy	1,281
UK	495
USA	487
France	329
Germany	270
TOTAL	**2,862**

Table 13: Selected country export trade statistics.

However, when considering this data it should be born in mind the inherent difficulty in accurately capturing world wide trade data, particularly when product definitions and categorisations vary so widely. This data is therefore likely to include other motorboats not in the 26 feet to 125 feet classification used in this report.

4.2 Product types and brand profiles

With over 130 models of luxury motorboat being produced by the brands covered by this study, there appears to be a great deal of customer choice. The level of specification varies in the UK with some manufacturers offering a basic specification and others offering completely kitted out motorboats complete with living essentials such as kitchen equipment, bed sheets and towels.

All manufacturers offer a range of cost options that the customer would choose when they specify their boat with the retailer. Evidence suggests that the UK manufacturers are ineffective at processing motorboat specification change[14]. Moreover, the true cost of specification change does not appear to be captured as there is a lack of business process to capture this data and ensure that real profits are generated. The general maxim at the

[14] Source: Manufacturer information.

manufacturers is "…*what sir wants, sir can have*". The manufacturers are facing a typical luxury goods conundrum of being able to live up to a reputation for exclusivity while delivering wide customer choice and customisation. Managing a tight product specification and production process to ensure that the products and options offered, do actually make money is a real challenge. The "all things to all men" business model takes very strict management to ensure that it generates real profits.

Although manufacturers have different or proprietary terms to describe their motorboats to their customers, their products predominantly fall into the following categories:

- Flybridge - comes with an additional navigational bridge, often open, located on a deck above the pilot house;
- Sports/performance - generally comes with a performance engine(s) and associated design and styling features;
- Cruiser – motor boats generally used for longer cruising periods.

All of the motorboats covered in this SCA are likely to have cabins and living accommodation and additionally, the larger craft are likely to have crew quarters. Some manufacturers however specialise in particular motorboat types, for example flybridge, and others offer a number of different product segments to appeal to the widest possible customer base. Most of the UK manufacturers are very firmly positioned in the large yacht segment where they produce their volume motorboats.

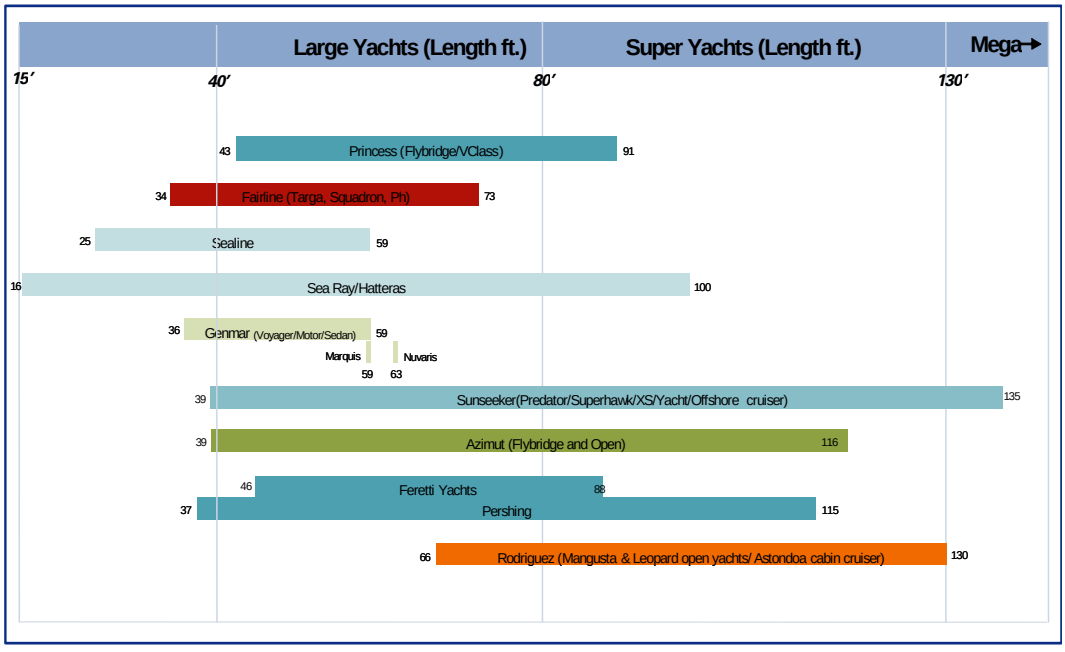

Figure 3: Boat builder products by length of boat (LOA)

(a) Source manufacturer literature and websites

Although figure 3 only shows the key manufacturers in the industry, there is likely to be less competition in this segment with fewer players being able to offer these large, high value products, although the customer base will also become smaller.

The Italian manufacturers in this SCA appear to offer larger motorboats with larger and larger craft being offered every year. Azimut has typically offered flybridge motorboats but has recently launched the Azimut Open 68S and the Open 86S, to much acclaim. The 86S motorboat is 86 feet in overall length.

Marketing literature across the industry focuses heavily on performance, both sea-keeping[15] and also absolute power in knots. Industry participants state that exceeding the "psychological 40 knot barrier" is a must in this segment. In fact, all of the manufacturers display brochure pictures of motorboats, in high-speed action, demonstrating that as well as being a luxury and expensive motorboat, their craft are also very capable performers. Engine power and the type of drive system installed are clearly an important product feature (the engine and driveline represent the largest single cost element of a motorboat[16]) and provide a valuable means by which to create product range differentiation and additional price points. There can therefore be significant differences in price for motorboats of the same length with more powerful engines and drive lines.

The motorboat segment under examination in this report provides product at the very top end of the price band for fibreglass hulled boats. Individuals who purchase these boats are wealthy, often successful and probably lead lives that many people aspire to. The industry marketing literature reinforces this aspirational lifestyle with its glossy pictures and expensive style and associative product placement with other luxury brands such as motor car and jewellery brands. The challenge for luxury brands is how to tap into this lifestyle psyche by creating products that have measurable, hard product features and benefits, linked to a product surround of softer lifestyle and life stage elements. The total package should add up to a brand identity that is completely synonymous with the company, a particular lifestyle and the customer base. This will drive marketing activity and brand communications to target the customer base. This is an important consideration for luxury brands because by definition, their customer base is relatively small and limited to those who have sufficient wealth. Therefore defining a particular customer base and positioning the brand to cater for their needs should be a fundamental part of luxury brand strategy. Luxury sector commentators suggest that luxury, high-ticket purchases such as motorboats, jewellery, art etc. are not rational purchases, made on a logical comparison of price and specification but rather purchases made on a more emotional level. They are typically purchases that are desired, rather than born out of utility or need and are therefore discretionary.[17]

[15] Seakeeping – performance of the boat at sea.
[16] Source: Industry participants.
[17] Source: KPMG research.

4.3 Perceived market trends

4.3.1 Growth of the customer base

Industry participants indicate that the customer base for luxury motorboats is global and mobile in nature[18]. Customers entering a retailer in London for example, and ordering a boat to be registered in Egypt or the Mediterranean appears to be a common type of buying pattern.

Evidence from industry participants about the type of people who purchase luxury motorboats is mixed in that there is no conclusive data defining customer groupings or demographic groupings. Participants are generally united however in their belief that individuals who do purchase these products are of high net worth. There has been an upward trend over the last few years in the number of high net worth individuals (HNWIs) and therefore the amount of wealth in circulation, particularly in Europe and North America as shown in Figure 4.

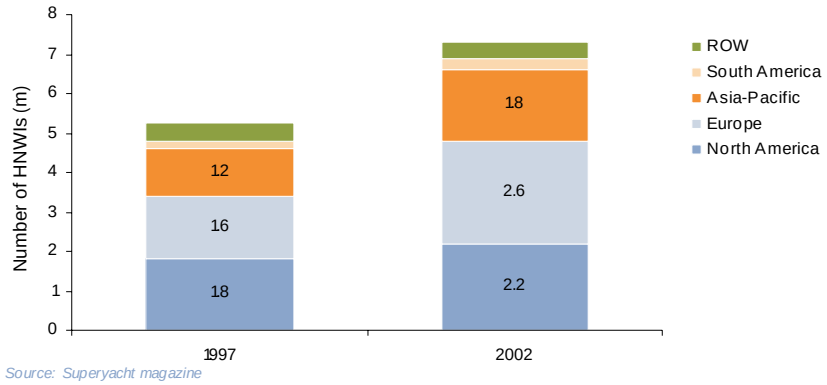

Figure 4: The increase in high net worth individuals by region.

Rodriguez Group[19], estimate that the number of wealthy people with financial assets in excess of $30 million (very high net worth individuals (VHNWI)) at more than 50,000 world wide, and that for the world's wealthiest people, the ownership of a yacht has become a "must". This number remains high in relation to the number of yachts built worldwide Company information from Ferretti specifically states that this sector is their core target market.

Industry participants highlight that customers purchase luxury motorboats for a variety of reasons, from experiencing the enjoyment of serious sailing, to simply owning a motorboat to display their wealth and status. The design and architecture of fibreglass hulled motorboats dictates that they are ideally suited to offshore cruising, rather than for ocean going travel and so boat usage is limited to coastal cruising, island hopping and other near land boating, so the usage cycle is likely to be fairly uniform. Whether buying

[18] Source: Interview programme.
[19] Source: Rodriguez Group annual report 2003.

a motorboat new or used from a broker, the costs of running the craft can be significant and are highlighted by industry participants to be approximately 20% per annum of the retail price. This cost covers items such as registration, mooring fees, insurance, fuel etc.

Although there is limited hard evidence that defines particular customer types, the vast product range and associated price range is very wide and puts boats into the reach of a significant number of people, particularly with some of the mortgage products on the market[20].

4.3.2 **Impact of design and customer knowledge**

The survey of manufacturers and dealerships highlighted two views on differences between UK and Italian brands which focused on:

- The quality of the design of the product[21]. The UK manufacturers believe that there is a long heritage of design and style expertise in Italy and that the Italians lead the industry in product innovation, use of new technology, use of new materials (e.g. carbon fibre) and new colours (e.g. black). They are pushing the style boundaries and producing designs that are more angular and adventurous.[22] Conversely, there are mixed views on the quality of Italian made motorboats, with some participants believing that the quality is not up to that of the UK's products.
- A better understanding or relationship with the customer base in Italian companies,, partly driven by stronger knowledge of the HNWI customer base because of the group involvement in mega-yachts and other segments, and partly by a greater focus on market research and customer 'ownership' rather than relying on dealers[23].

4.3.3 **Boat trends**

Evidence suggests that there is a trend towards larger motorboats being offered by motorboat manufacturers. In addition, these larger motorboats are also likely to be more highly specified and luxurious than their smaller counterparts. It is unclear whether customers are demanding larger motorboats or that because of the rise in wealth of the customer base, the manufacturers have developed these products and the customer base has reacted accordingly. There is however, belief in the UK industry that the Italian industry will continue to offer ever larger motorboats.

An increasing average size of motorboat has been highlighted as a problem by some manufacturers and retailers, particularly those that operate in the larger product segments, because by increasing the size range, and losing the smaller, entry level motorboats the financial barrier to getting into boating has been raised. Purchasing a first boat is slowly becoming more expensive. For many of the manufacturers, the motorboat at the bottom of their product range now costs around £324,000[24]. Evidence from one retailer suggests that 15 years ago, the average motorboat size was around 15' to 30'. Now first boats are

[20] Source: Industry participant.
[21] "The Europeans have proven that style sells products" George Buckley, CEO Brunswick
[22] Source: Industry participants.
[23] Source: Industry participants
[24] Source: Retail price lists.

around 50’ to 60’ with customers trading up to even larger motorboats in just a few years[25]. This statement may also be an indication of the high degree of customer loyalty in that they set their mind on purchasing a particular brand and then don’t want to move away from the brand, even when costs become higher. Again, evidence from retailers suggests that a high proportion of their purchases are repeat purchases and that converting a prospective customer from another brand is quite difficult to achieve.

[25] Source: Industry participant.

5 Analysis of Value Added and financial returns

5.1 Product market strategies

Section 4 summarised the overview of the market and the comparative product ranges of the brands covered by the study. A review of the price lists and marketing literature for the different companies shows that the product market strategies of the brands are very similar, being based on a basic unit design and price with a series of defined options and prices.

The range of options publicised by the companies does vary with Sea Ray literature offering the largest range. This reflects the slightly different product range strategy of the Brunswick Boat Segment which is based on what is called the 'ladder concept'. This looks to maximise choice for customers by providing boats of many different sizes with many options on functionality and quality. The policy of the European brands appears to be more segmented with a smaller range of boat sizes and a focus on target customer groups.

5.2 Value Added

Table 14 shows the comparative performance of the different brands' product strategies in terms of Value Added, both in total and per workforce member. The basic definition of Value Added for a company is sales less the cost of bought-in materials, components and services[26].

Brand	Country	Total Value Added in $ millions	Value added per FTEE in $	% of average
Ferretti	Italy	81.6	103,600	140
Azimut	Italy	112.5	91,248	124
Pershing	Italy	27.9	83,690	113
Sea Ray	USA	133.6	78,969	107
UK 4	UK	65.2	59,985	81
UK 3	UK	86.8	59,376	80
UK 1	UK	85.0	57,697	78
UK 2	UK	30.7	55,549	75

Table 14: Value added by brand.

[26] The data needed to calculate Value Added in this way is rarely given in annual reports. An alternative derivation given in the DTI Value Added Scoreboard is Value Added = Operating Profit + Employee costs + Depreciation & Amortisation, where operating profit is defined as profit before interest, tax and dividends and, for the purposes of calculating VA, net of certain exceptional items - specifically the profit or loss arising from disposal of a subsidiary or assets.

The weighted average for the eight brands is about $72,000 per FTEE. Based on the DTI 2005 Value Added Scoreboard, this figure is similar to the European aerospace and automotive sectors.

The Italian brands delivered results per FTEE significantly above the average with Ferretti the highest at about 140% of the average. Sea Ray in the USA achieved a close to average result. The UK brands showed very similar results at about $55,000 to $60,000 per FTEE, which is only between 75% and 81% of the average for the total sample. In total, the UK companies generated Value Added of about $268 million in 2004.

Section 6 analyses these productivity differences in terms of (a) the pricing productivity of the company or brand, and (b) the efficiency with which inputs are used in production.

Table 15 compares the wealth creation efficiency (Value Added/(employee[27] costs + depreciation)) of the different brands. The purpose of this is to enable comparison with the companies for whom this measure has been calculated in the DTI 2005 Value Added Scoreboard.

Brand	Country	Wealth creation efficiency %
Ferretti	Italy	115
Azimut	Italy	187
Pershing	Italy	207
Sea Ray	USA	154
UK 4	UK	136
UK 3	UK	137
UK 1	UK	130
UK 2	UK	117

Table 15: Wealth creation efficiency.

The overall measure for the sector is 148% which again comparing with the DTI 2005 Value Added Scoreboard is slightly above the European average for all sectors of 144%. At this level, the segment is significantly more efficient in wealth creation than the automotive and aerospace sectors which have ratings of about 120%.

At an individual brand level, the picture is similar to that for Value Added per FTEE, with the exception of the Ferretti brand which while being the leader in Value Added, appears as the least efficient in wealth creation. The explanation for this is the high level of depreciation within the Ferretti accounts equivalent to about 18% of turnover. This is reviewed in more detail in section 7.

The measure of Value Added is primarily driven by the ability of a company to convert the cost of bought-in goods and services into revenue. The two main drivers of this are the pricing productivity of the company or brand, and the efficient use of converting materials into output. These are looked at in more detail in section 6.

[27] Employee costs have been adjusted to include the estimated costs of sub-contract labour

5.3 Net Value Added

Net Value Added, defined either as Value Added less employment costs or as operating profit plus depreciation plus amortisation, is a useful measure of the productivity of a manufacturing company in combining the efficient use of both materials and direct production workers. It is the main benchmark[28] used by businesses in evaluating options and supporting commercial decisions.

Figure 5 summarises the results for the brands of Net Value Added per FTEE and as a percentage of total assets.

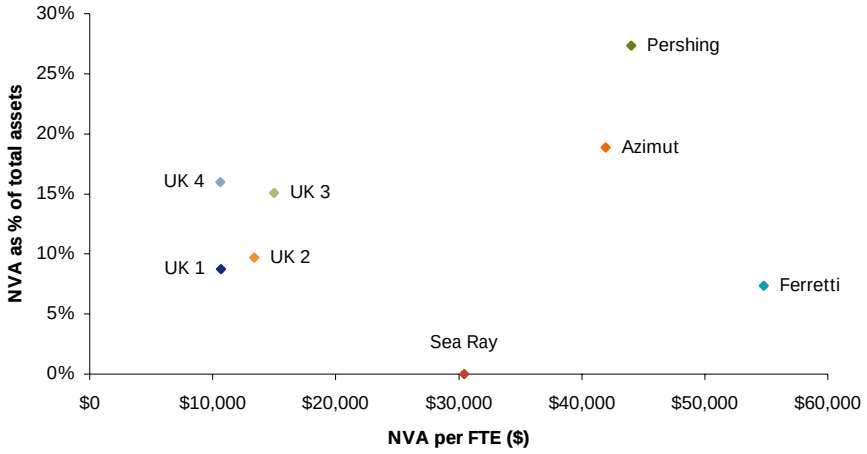

Figure 5: Net Value Added (NVA) as a per cent of total assets and per FTEE.

Figure notes.
(a) The data for UK companies was obtained from the interview programme.
(b) The data for US and Italian brands was obtained from accounts, company information and industry interviews – the value of total assets was not available for relevant Sea Ray plants.

The results show two clear clusters. The UK companies generated between $10,000 and $15,000 per FTEE with returns on assets between 7% and 16%. In clear contrast, the Italian brands appear to have generated between $40,000 and $55,000 NVA per FTEE. The capital productivity was much more varied for the Italians with Pershing and Azimut outperforming the UK companies, but Ferretti recording a lower figure. However, the Ferretti SpA balance sheet includes a very high level of intangible assets which drive a depreciation and amortisation charge of about 18% of revenue against the industry norm

[28] Net Value Added is equivalent to EBITDA (Earnings before interest, tax, depreciation and amortisation) which is commonly used by analysts in assessing economic value of companies

of about 2%, which is then offset by a high financial income from the Group[29]. Sea Ray appears to fall between the two clusters in terms of NVA per FTEE, but as previously noted, total asset figures are not released by Brunswick Corporation for this level of the organisation, so no comparison is possible.

Ignoring Sea Ray and Ferretti, Figure 5 should not be interpreted as a result that there is a positive correlation between return on assets and profitability per employee. The slope is determined solely by the Total Assets per FTE ratio, which are much higher at Pershing and Azimut than the UK companies.

The implications of efficiency and productivity on the measure of Net Value Added are reviewed in more detailed in sections 6 and 7.

5.4 Financial returns

Financial returns are a key measure for operating companies in any business sector. This section develops the analysis of profitability in Section 5.3 by comparing the performance of brands using two standard measures of profitability used in business: Operating Profit[30] as a percentage of Sales, and Operating Profit as a percentage of Total Assets.

The logic of scaling operating profit by sales is that it gives a measure of the overall performance of different companies in the use of the combination of bought-in goods and materials, labour and the cost of assets. Unlike the measure of Value Added, operating profit is not affected by decisions on in-sourcing or out-sourcing unless these change the actual cost base. Similarly, the benefit of scaling profits by total assets is that this gives a measure of the gross return on all financial assets used by the company, regardless of the type or nature.

Figure 6 shows the Return on Sales for the sample brands. This again shows the polarisation of results, with the Italian builders generating higher returns than all of the UK companies. However, the results for the UK show a very different picture from the Value Added per FTEE results shown in Table 14 which showed very similar results for each UK company. The return on sales ranges from around 3% to 10% which indicates that there are considerable differences in the efficiencies of the different companies which are not shown by the overall Value Added result. Similarly, the result for Sea Ray shows a result at about 8% profit on sales, which is in line with the average for the UK companies, a different result from the Value Added per FTEE. This suggests that overall efficiencies at Sea Ray are broadly comparable with the UK.

The reasons for these comparative performances are explored later in Sections 6 and 7.

[29] The VA and NVA calculations include depreciation and amortisation charges. However, the depreciation and amortisation for Ferretti is emphasized to highlight the size of the charge and degree of financial engineering undertaken in a larger, more diverse group of companies.
[30] Operating Profit is calculated as Net Value Added less depreciation and amortisation, or as profits before interest and taxes.

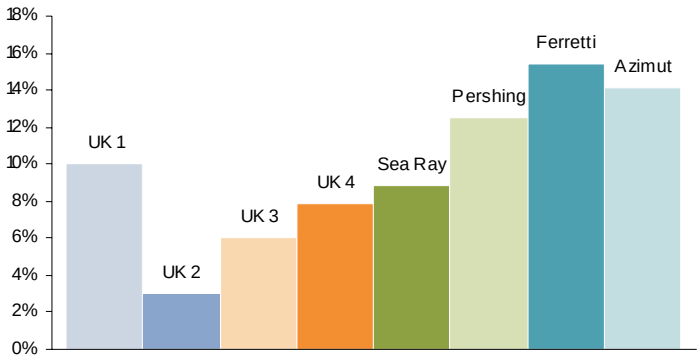

Figure 6: Return on Sales.

Figure notes for Figures 6, 7 and 8:
(a) The data for UK companies was obtained from the interview programme.
(b) US and Italian data were obtained from accounts, company information and industry interviews.

The return on total assets is shown in Figure 7.

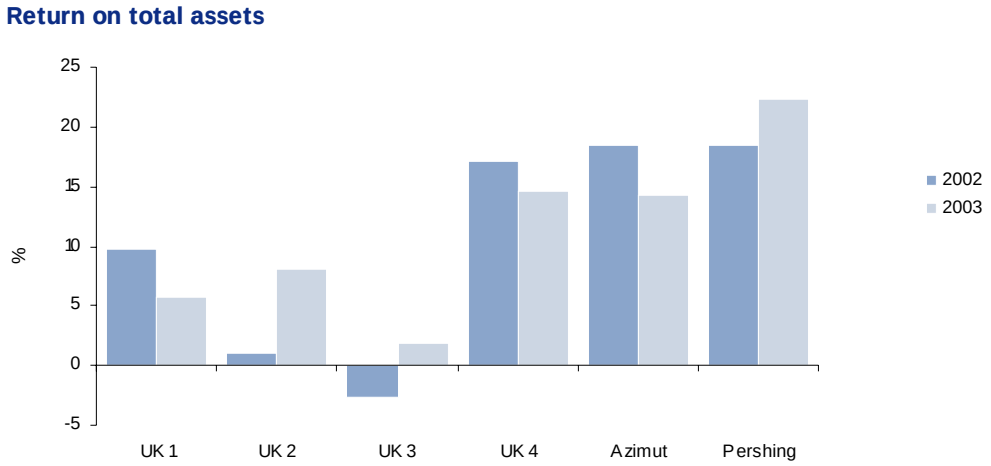

Figure 7: Return on total assets.

Figure 7 shows that Azimut and Pershing have the highest return on total assets of boat builders included. Sea Ray is not included because a break-down of asset values was not available between the plants that build boat sizes within the scope of the study and those that focus on smaller boats. Similarly, the Ferretti results are anomalous because of its role within the Group's financial structure, see Table 4. The UK boat builders generally have lower return on assets, apart from UK 4 which is comparable to the leading Italians.

6 Analysis of productivity

This section reviews differences in the manufacturing strategy of the brands and then analyses the comparative productivity in the three areas of:

Section 6.2 Pricing productivity – that is the price obtained by each brand per standard output unit;

Section 6.3 Materials efficiency – that is the comparative cost of materials per standard unit of output;

Section 6.4 Labour efficiency – that is the productivity of the direct production force.

Because each of these sections is relatively long, we have included a brief summary of the approach to the analysis and the findings at the beginning of each of the three sections.

Section 6.5 provides a Typical Cost Structure which shows the combined impact of these three areas on the generation of value added, and Section 6.6 completes the analysis by looking at the productivity of capital.

6.1 Manufacturing strategies

Section 5.1 compared the product market strategies of the different brands and the performance on Value Added.

The manufacturing strategies also show a strong commonality with the basic characteristics being:

- A build-to-order focus and not build-for-stock
- A three stage process based on hull manufacture-assembly-trials and finishing.

There are significant variations on this strategy, which are

- Azimut outsources the production of larger hulls above 74 feet LOA together with wood furniture. Similarly, the Ferretti Group outsources a proportion of hulls and furniture to third parties, although the majority is manufactured by two group companies, Resin Sistem and Diesse Arredamenti who supply all the operating companies in the Group. For the purposes of this study, this supply system has been treated as outsourcing or sub-contracted labour to develop comparative information.
- A second variation is the use of sub-contract labour by the Italian brands which applies to both direct production and non-production activities.
- A third variant is hull manufacturing, where the normal system is to have a specialist mould shop with completed hulls then being transported to assembly lines. One UK company has a different approach based on a cell system with integrated mould and

assembly lines at separate manufacturing units which focus on a narrow range of boat sizes. A similar approach is used by Sea Ray with its six separate manufacturing plants which have separate moulding facilities.

While build-to-order is the preferred approach, there are examples of build-for-stock. One example is with new product launches where an initial boat is built for exhibition without a customer order, for example with the recent Pershing 116 launch and exhibition in China. A second example is Sea Ray who do build smaller boats for dealer stock, but are targeting reducing this as electronic components become more integrated and customer options are less able to be added-on at dealerships post-manufacturing.

6.2 Pricing productivity

This section examines the extent to which the prices of boats vary, and to which this can be explained by basic physical characteristics such as weight and length.

We show that:

- Revenues per tonne increase with boat size (tonnage or length)
- There is a wide variation in revenue performance that cannot be explained by variations in boat size alone
- The Italian brands tend to generate significantly higher levels of revenue per tonne, though only Ferretti and Pershing have a high price productivity index: that is they generate revenues higher than normal for the size of boat.
- There are significant variations within the UK brands in the revenue generated per tonne, both in absolute terms and relative to the size of boat produced.

Figure 8 below shows the revenue generated per tonne and per FTEE, by the different brands. The purpose of this chart is to show the wide dispersion in revenues between boatbuilders however these are scaled, by output weight or per employee.[31] Clearly, revenues will increase with tonnage, but the wide dispersion in revenues per tonne shows that leisure craft are not commodities whose price can be explained by a simple quantitative measure like lengths of steel. Table 16 shows that revenues per tonne increase with the average weight of the boats produced.

[31] The correlation between these measures results from differences in tonnage per employee, cf Figure 10.

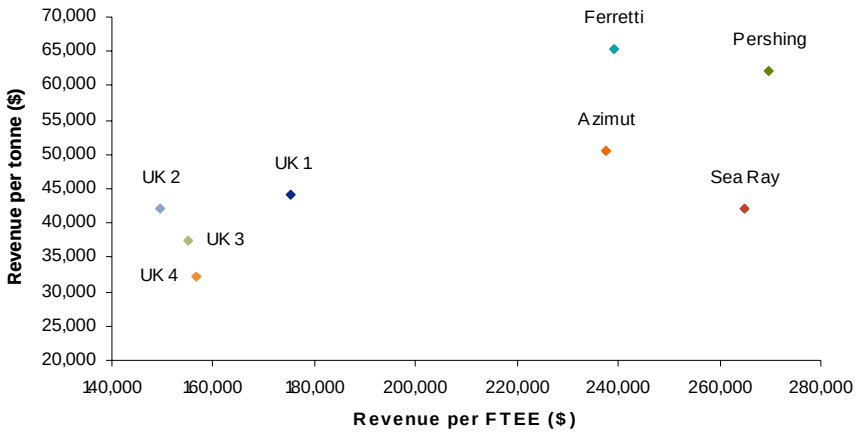

Figure 8: Average revenue per tonne versus revenue per FTEE.

Source notes:
(a) The data for UK companies was obtained from the interview programme.
(b) The data for US and Italian brands was obtained from company accounts and corporate information.

For revenue per FTEE, there are two groupings: UK companies generating between $150,000 and $180,000 per FTEE; and non-UK companies generating about 50-60% more per unit of labour.

For revenue per tonne of output, the position is more complex. For all brands, the simple arithmetic average revenue[32] per tonne is $46,801. Brand performance can be divided into three groupings:

Premium brands: Ferretti and Pershing which generate $62-65,000 per tonne
Median brands: Azimut, UK 1, Sea Ray and UK 2 with $42-50,000 per tonne
Base brands: UK 3 and UK 4 which generate $32-$37,000 per tonne.

The connecting link between the two measures of pricing productivity is of the level of output per FTEE which is shown in Figure 9.

[32] The average revenue is revenue to manufacturers, after dealer discount

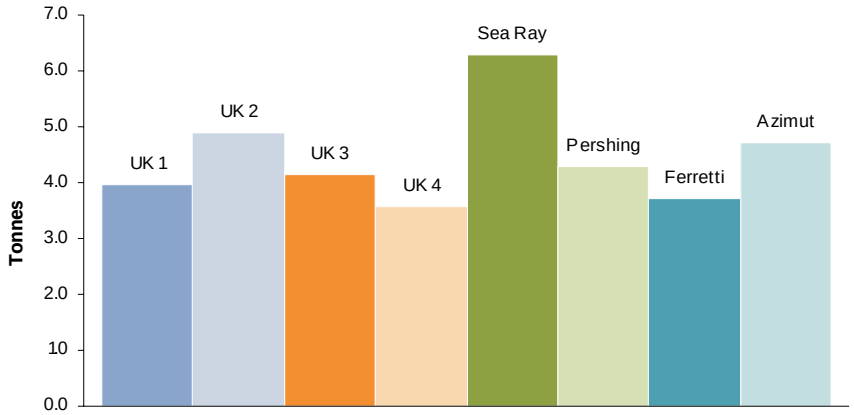

Figure 9: Output in tonnes per FTEE.

Source notes:
(a) The data for UK companies was obtained from the interview programme
(b) The data for US and Italian brands was obtained from corporate information and industry sources

The exceptional performance would appear to be from Sea Ray with a production output of about 6.3 tonnes per FTEE. The remaining brands vary between 3.6 and 4.9 tonnes per FTEE with similar performances across Italian and UK brands.

There appears to be a strong correlation co-efficient between the rankings on revenue generation and the rankings on Value Added as shown in Table 14. Table 16 combines these two rankings together with the average size of boat sold by each of the brands.

Brand	Value Added per tonne in $	Revenue per tonne in $	Average boat size in tonnes
Ferretti	27,543	65,395	30.6
Azimut	19,398	50,480	24.6
Pershing	19,220	62,285	25.9
Sea Ray	12,590	42,226	13.4
UK 1	16,851	42,022	13.4
UK 2	14,957	44,157	21.2
UK 3	13,923	37,423	20.6
UK 4	11,389	32,128	7.5

Table 16: Productivity per tonne against boat size.

This shows a correlation of 0.89 between the Value Added and revenue per tonne, and a correlation of 0.86 between the revenue per tonne and the average weight of the boats sold by the different brands.

The implications of these findings is that larger boats can achieve higher revenues per tonne in the market, and that the higher productivity of the Italian brands in terms of Value Added may solely be the result of making and selling larger boats.

To investigate this further, the individual retail price structures of the different brands were reviewed. Figure 10 shows the retail price ranges[33] of the sample brands.

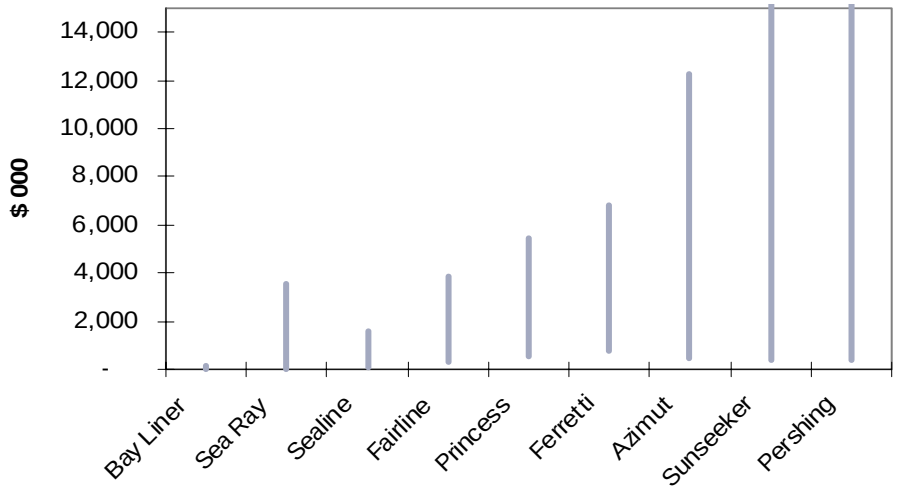

Figure 10: Price ranges for the key luxury motorboat brands.

Figure 10 demonstrates the very wide range of prices in this single sub-segment of the market, with prices varying from a lower limit of about $85,000 to a top-end price in excess of $14 million. The most expensive boats are marketed by Pershing and Sunseeker with Azimut close behind, with the Brunswick Corporation brands of Sea Ray and Sealine, together with Fairline, having top-end prices around $4 million.

The Bayliner brand has been included purely for comparison. Bayliner is the second largest US boat builder after Sea Ray and both are owned by the Brunswick Corporation. Bayliner produces boats between 16 and 32 feet LOA, in direct competition with the smaller Sea Ray ranges excluded from the scope of this study. Prices range from an entry point of $12,000 to a top end of $121,000, illustrating the gap with the luxury segment under review here.

[33] All price data for this chart is shown in $US from the manufacturers' published price lists.

While Figure 10 shows the price comparisons in the industry standard format of retail price by length (LOA), Figure 11 restructures the price lists to show retail prices as $ per tonne for the different brands against the overall length.

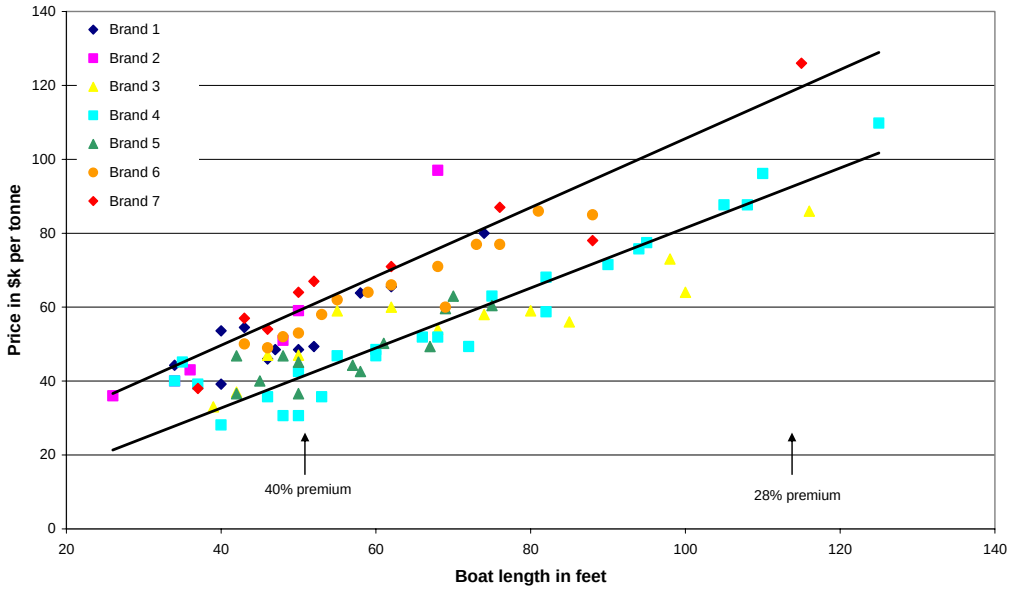

Figure 11: Comparative brand retail prices per tonne.

Figure notes
(a) Values are retail prices excluding taxes for brands in their main markets i.e. European prices for European brands and US prices for Sea Ray
(b) This slightly exaggerates the comparative prices for Sea Ray (shown as Brand 2) because dealer margins in the US are higher than in Europe at about 30% compared with 20-25%
(c) The price of a single model of a boat will vary depending upon the options chosen by the customer, of which the most variable one tends to be the engine. For this chart, the mode value on the price list has been used.

Figure 11 shows a number of important features:

- In general, the price per tonne increases with the length of the boat, and this is common to all brands. This would suggest three alternatives: firstly, that as the length increases, the functionality of the boat is upgraded and/or quality improvements are made to justify a higher price to customers; secondly, that larger boats generate larger profit margins; or the reason is a combination of the first two.
- The chart also shows that brands have different pricing strategies. Two trend lines are shown for Brand 4 and Brand 7 that have a similar range of boat sizes and which industry commentators view as comparable in functionality. These show that Brand 7 has a 40% higher price at the bottom of the range and a 28% higher price on larger size boats;
- Some brands appear to have inconsistent pricing strategies. For example, Azimut (shown on the chart as Brand 3) appears to follow the normal increasing price trend

up to about 60 feet. Between 60 and 90 feet, the price per tonne appears to be relatively constant, but increases again on the largest boats.

Now Figure 11 has shown a relationship between price per tonne and boat length on a brand-by-brand basis. Using weight of boat rather than length, an overall comparison between sales revenue per tonne and boat weight shows that there is a close relationship between these two variables, so generally as the weight of the motorboat increases (along with its specification and features) manufacturers charge more per tonne of boat.

Figure 12 views the data differently by mapping the price per tonne against the weight of the boats, combining all the available brand information. The purpose of this is to develop an overall assessment of the relationship between pricing and weight against which individual brands can be benchmarked. It should be noted that the sample set in Figure 11 and Figure 12 is different because some brands were not prepared to release comprehensive data on their boat weights.

Figure 12 shows a reasonably strong correlation overall with a value of 0.7.

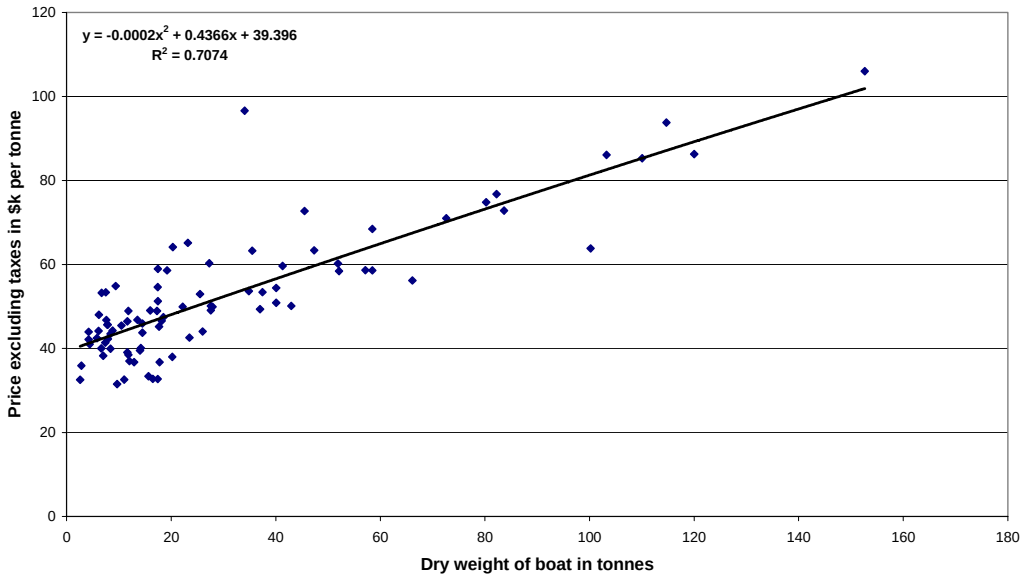

Figure 12: Relationship between boat weight and boat price.

Figure notes:
(a) The data was obtained from interview programme and company brochures
(b) The sample set excludes Sunseeker and Pershing but includes Bayliner
(c) Discounts have been factored in for dealer margins

From this data, a standard sales price per tonne for a particular weight can be derived, which is shown by the formula of the trend line on the graph, against which the actual

revenue achieved by each boat builder can be compared. This provides a basis to determine if a boat builder is achieving a market premium.

This pricing standard is independent of differences in the functionality and the quality or intensity of materials between different brands for any particular size of boat, but does take into account any differences common across the brands at different sizes of boats. Based on the information in Figure 12, a boat of 20 tonnes in weight would be expected to generate $48,000 a tonne in revenue, whereas one of 40 tonnes would be expected to generate $56,500 a tonne.

Figure 13 compares the relative positions of the boat builders against a standard of 100 based on the average weight of boats produced by the brand. The boat builders achieving a price premium have an index in excess of 100.

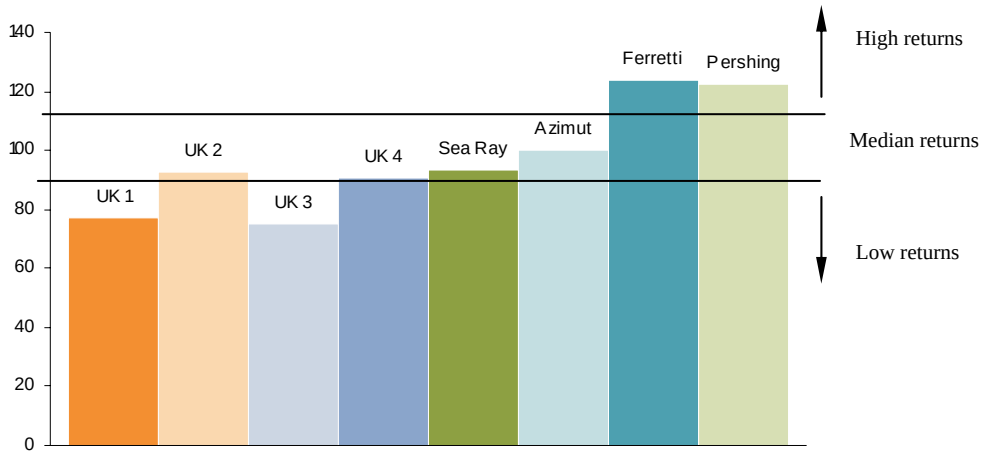

Figure 13: Price productivity index.

Figure notes:
(a) The data for UK companies was obtained from the interview programme
(b) The data for Italian and American brands was obtained from company accounts and corporate information.

This grouping reflects the apparent clusters identified in Figure 8 but by introducing a compensation factor for the differences in sizes of boats produced, has reduced the apparent differential between the brands. In other words, one important explanation of the lower observed average revenue per tonne of UK boatbuilders is that they build smaller boats. The extent to which their average revenues per tonne lag those of other builders of similar sized boats is much smaller.

The different performances of the brands in terms of the price productivity index could be because there are differences in:

- the costs per tonne of producing larger boats - construction methods could be more costly, or contents more sophisticated, e.g. equipment
- functionality, quality and design, related either to size of boat or market positioning
- sophistication of brand positioning or market positioning.

All three are likely. In principle, data could be collected to quantify the effect of the first two since they relate to physical characteristics of a boat just as do length and weight. To the extent that these are reflected in higher materials costs, their impact on revenue can be assessed. This is investigated more fully in section 6.3, the results from which suggest that differences in costs do not entirely explain the differences in prices observed for a given size of boat.

Once these are taken into account, it is likely that any unexplained residual is due to (c) factors such as brand positioning, better design, and more innovative products. The extent to which these explain revenue differences is discussed in sections 7.1, 7.2 and 7.3.

6.3 Materials productivity

The previous section revealed a wide spread in revenues per tonne for all boat sizes. This section explores the extent to which this might be due to higher costs of bought-in services and goods (BIGS) by:

- Comparing the intensity of bought-in goods and services in production
- Breaking down expenditure on materials into the main components
- Showing how the cost of materials per tonne varies by weight of boat and boatbuilder

The main results are that:

- All the boatbuilders have similar levels of materials intensities, measured by weight against volume
- Materials costs per tonne do increase with boat size measured by dry weight tonnes
- The cost of BIGS varies from 57% to 70% of total revenue
- The two brands with the highest pricing productivity (Pershing and Ferretti) have much higher materials costs per tonne, although only for Pershing is this unusually high for the size class of boat
- The Italian brands spend a much higher amount per tonne on external services, which include a wide range of services from power supplies to advertising and design

The cost of bought in goods and services (BIGS) forms the most significant cost for the boat builders. BIGS includes all components, raw materials and services such as utilities and advertising. Figure 14 below shows BIGS as a proportion of sales revenue. There are significant differences between builders, with a range of values from 57% for Ferretti to 70% for Sea Ray.

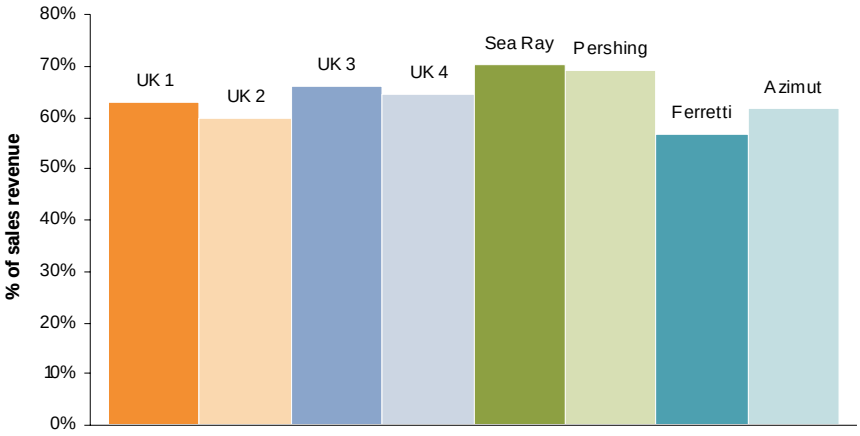

Figure 14: Bought in goods and services as % sales revenue.

Figure notes:
(a) The UK data was obtained from interview programme
(b) Italian and US data from company information and industry interviews

6.3.1 Materials as a component of BIGS

Materials are defined as those bought-in goods that are directly processed to form the finished product. In total for this sample of boat builders, materials account for about 80% of the total value of BIGS, and between 45% and 56% of total revenue. The spend categories for the UK companies for 2004 were identified with the largest being engines making up about 35% of total material costs. The overall results are shown in Table 17.

Commodity group	% of total spend on materials
Engines	35.5
Power trains (propellers, exhausts etc)	3.6
Generators	1.5
Marine glazing	6.1
Resin/gelcoat/GRP	9.3
Electricals and electronics	8.9
Air conditioning	1.9
Stainless steel	3.1
Timber and furniture	15.0
Upholstery and furnishings	12.8
Consumables	2.3

Table 17: Materials spend by category.

The individual results by company show significant variations. Examples include:

- Engines varying between 30% and 40% of total spend on materials;
- GRP/resin/gelcoat between 7% and 14%;
- Timber and furniture between 9% and 17%;
- Upholstery and furnishings between 7% and 17%.

Because of the apparent differences in functionality at different boat sizes, a hypothesis is that the relative spend on commodity groups would vary from brand to brand. For example, larger boats generally have more cabins and therefore expenditure on furniture and furnishings could be higher, whereas the proportion of materials required for the hull could be lower.

The individual responses from the different UK brands were reviewed to see if they supported the hypothesis. In some cases there would appear to be a correlation between the spend category and the average size of the boat produced, but the correlation appears weak. Similarly, comparisons for single brands over the period 2002 to 2004 showed variations in the percentage spend on different commodity groups. The explanation offered by the companies was that this was the result of the impact of procurement timing over year ends, given the relatively low volumes involved, rather than any change in product strategy for the brands over the period reviewed. This does not invalidate the hypothesis that the relative spend on different commodity groups changes with the size and functionality of the boat, but does illustrate the difficulty of aligning information from the survey respondents.

The cost of materials included in BIGS was considered against tonnage to establish further understanding of material productivity. This shows that Pershing and Ferretti have significantly higher material costs per tonne than the rest of the boat builders, see Figure 15.

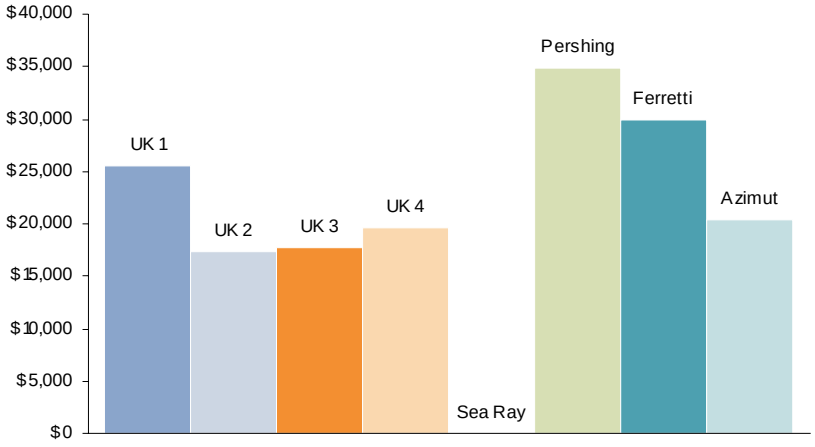

Figure 15: Material cost per tonne.

Figure notes:
(a) The data was obtained from interview programme, web-site review and industry specialists
(b) Material cost per tonne was unavailable for Sea Ray

A review of material costs per tonne compared to average boat weight shows that builders producing heavier boats have a greater cost per tonne than those producing lighter boats.

This is an interesting finding given the overall that material intensity is relatively common across all boat sizes as shown in Section 3.1.4.3.

As with pricing efficiency, a meaningful comparison needed to be developed by taking increasing boat size into account. Our field observations and discussions with the boat builders revealed that for heavier boats the specification increases, for example more entertainment equipment and a fully equipped galley might be installed, and these components tend to be more technologically advanced and offer improved performance and functionality.

Figure 16 plots material cost per tonne against the average weight per boat produced by each builder.

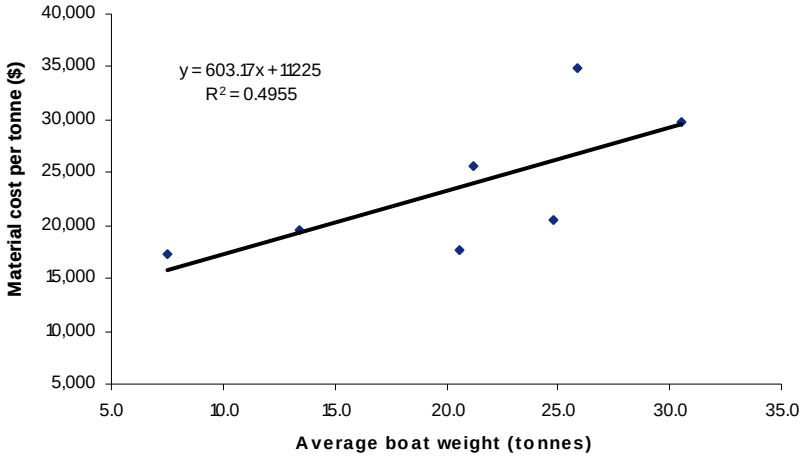

Figure 16: Material cost per tonne against average boat weight.

Figure notes:
(a) The data was obtained from interview programme, web-site review and industry specialists

A clear trend is observed showing increasing material costs per tonne as boat weight increases. If the trend line is taken as the standard to be achieved for a given tonnage, a materials cost standard for a particular weight can be derived against which each boat builder can be compared. Using the standard a material cost index can be derived. Figure 17 compares the relative positions of the builders against a standard of 100.

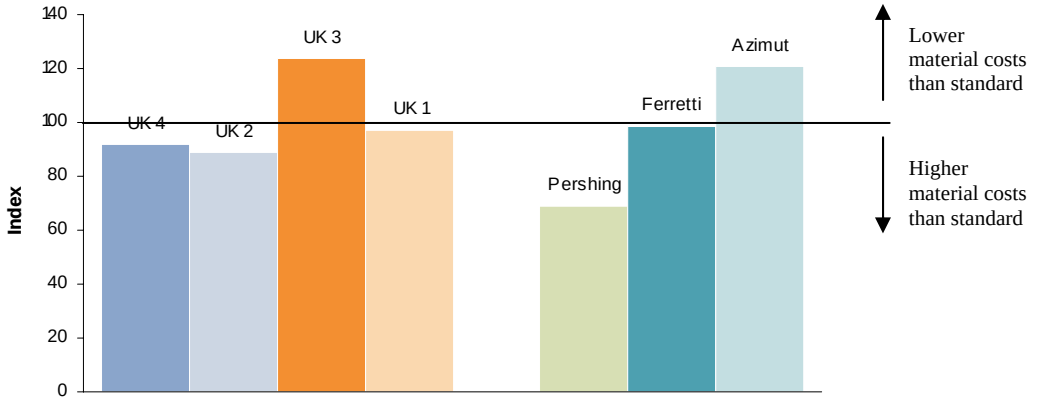

Figure 17: Material cost efficiency index.

Figure notes:
(a) The data was obtained from interview programme, web-site review and industry specialists

Figure 17 shows that UK 3 and Azimut spend least in terms of materials per tonne. This may be due to a number of reasons, including lower specification level for their boats, better procurement practices, more efficient use of materials (i.e. lower scrap and rework costs) or a combination of these factors.

However, the functionality, style or quality of materials may well be a factor because there seems to be a clear relationship between Pershing and Ferretti having the highest material costs per tonne and Pershing and Ferretti having the highest pricing productivity per tonne. Table 18 shows the relationship between generated revenues, material usage and other bought-in goods and services.

Brand	$ materials per tonne	Revenue per tonne as % of materials	$ other goods & bought in services per tonne[a]	Revenues per tonne as % of BIGS
Ferretti	29,861	219	6,181	181
Pershing	34,844	179	7,833	146
Azimut	20,445	247	10,640	163
Sea Ray	n.a.	n.a.	n.a.	143
UK 1	19,610	214	5,561	167
UK 2	17,762	211	5,739	159
UK 3	17,265	186	3,474	154
UK 4	25,597	173	3,603	152

Table 18: Value Added measures.

Table notes:
(a) The cost of services excludes the estimated costs of sub-contract labour
(b) The data was obtained from interview programme, web-site review and industry specialists

The data appears to confirm that Azimut is best able to convert the cost of materials into revenue, possibly through better procurement practices or through greater efficiency supported by higher technology levels. Pershing performs relatively poorly which might be explained by over-specification of the product. Ferretti and UK 1 and UK 2 appear to have median performances.

The Italian brands also spend a much higher amount per tonne on non-material goods and services (e.g. utilities, advertising and other administration) than UK brands, after compensating for estimated levels of sub-contract labour. This may be because of the group structure and the provision of centralised services. An alternative explanation is that they are buying in more of different services to help create higher revenue levels, for example through more effective marketing, advertising or product design - the Italian companies all use specialist external yacht designers. Information is not available at this level of detail, but the hypothesis is supported by the fact that the two UK brands with the highest cost of services are also the two with the highest revenue: materials ratio, with performances in line with the leading Italian brands. The UK sector does use external designers but has a greater emphasis on in-house design supported by naval architects as consultants.

6.4 Labour productivity

This section explores the extent to which higher productivity in terms of Value Added per FTEE is explained by more efficient use of labour, and the use of indirect labour. We examine how:

- Direct labour costs and hours vary across boatbuilders
- Direct labour costs per tonne vary with boat size
- Profitability per FTEE varies with labour intensity

The main results are that:

- Hourly labour costs vary significantly by company, but not between countries
- Labour hours per tonne increase with boat size
- Profitability per FTEE increases with labour efficiency both in terms of direct labour productivity and the ratio of direct to indirect workers

The four UK companies employed a total of 4,576 people in boatbuilding operations in 2004. This was a significant increase of about 8% on 2003.

The Italian brands also showed a similar growth in the size of the total workforce, although Azimut returned a lower growth than any of the UK brands. The Italian workforce also continued to move towards a higher degree of directly employed staff, a trend that industry contacts indicate is being driven three main factors: the increasing scale of production allowing more efficient use of specialist skills, the increasing use of technology and a need for specialist operating skills, and changes in Italian employment regulation. The information on a brand basis is shown in Table 19.

	Total workforce			% employed	
	2003	**2004**	**% change**	**2003**	**2004**
Ferretti	788	900	+ 14	68	76
Pershing	333	385	+ 15	52	53
Azimut	1,233	1,299	+ 5	62	69
Sea Ray	n.a.	1,692	n.a.	91	91
UK 1	1,355	1,474	+ 8	100	100
UK 2	1,352	1,461	+ 8	100	100
UK 3	1,031	1,088	+ 6	100	100
UK 4	499	553	+ 11	100	100

Table 19: Total workforce sizing and sub-contract models.

Direct labour costs per hour for the all the boat builders were compared to see if any significant differences emerged. Figure 18 shows that direct labour costs range from $18.67 per hour to $25.10 per hour.

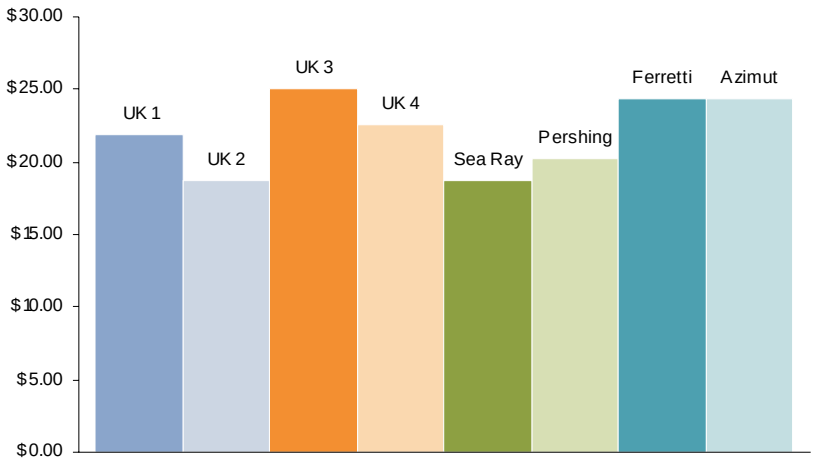

Figure 18: Direct labour cost per hour.

Figure notes:
(a) The data for UK companies was obtained from the interview programme
(b) Italian and US data from accounts, company information and industry interviews and labour market surveys

Direct labour costs are not the significant factor in explaining the large variance in Net Value Added per FTEE. The Italian builders that achieved significantly better NVA per FTEE have some of the higher labour costs per hour.

It is feasible that some builders are more efficient than others, yielding higher labour productivity and therefore better Net Value Added per FTEE. An examination of direct labour hours per tonne is a useful first comparison as shown in Figure 19. Total annual labour hours for the direct labour force of each boat builder were divided by the total annual tonnage of boats produced to calculate the direct labour hours per tonne.

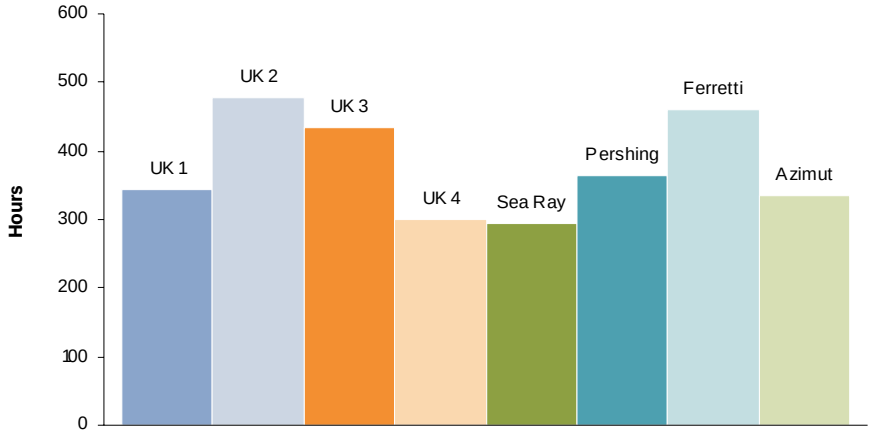

Figure 19: Direct labour hours per tonne.

Figure notes:
(a) UK data was obtained from interview programme
(b) Italian and US data from company information and industry interviews

The best performers appear on the surface to be UK4 and Sea Ray, with the poor performers being UK2, UK 3 and Ferretti. However, the above results do not take account of the size of boat produced by each builder. The previous section noted an increase in the cost of materials as the size of the boats increases. This increase may be mirrored by an increase in labour hours. Figure 20 plots direct labour hours per tonne against the average weight per boat produced by each builder.

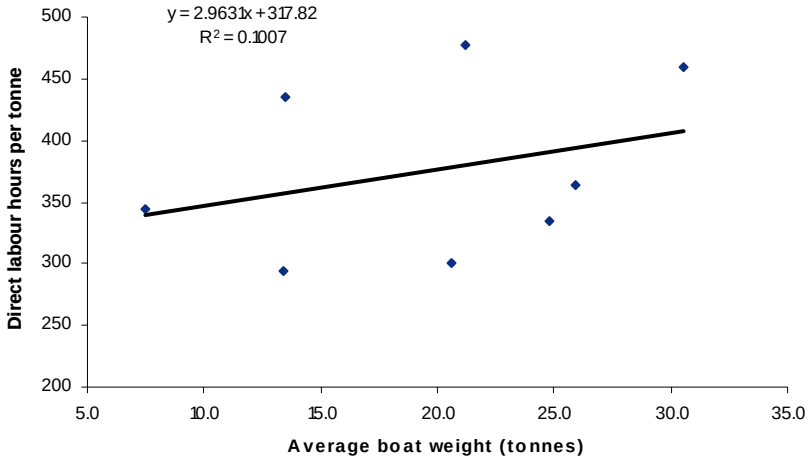

Figure 20: Direct labour hours per tonne against average boat weight.

Figure notes:
(a) The data was obtained from interview programme, web-site review and industry specialists

Figure 20 shows that as boat weight increases there is an increase in direct labour hours per tonne. Although the total correlation is relatively low, it is supported by the limited data provided by UK and Italian builders for individual products which showed a similar increase in man hours per tonne on larger boats.

Boat length index	**UK boat builder** *Man hours per tonne*	**Trend as Figure 20** *Man hours per tonne*
100	392	340
107.5	405	346
145	417	378

Table 20: Direct labour hours per tonne - company information

Figure note:
(a) Boat size is expressed as an index to maintain confidentiality of the information source

If the trend line is taken as the standard to be achieved for a given tonnage, a productivity standard for a given weight can be derived, against which each boat builder can be compared. Using the standard, an efficiency index can be derived. Figure 21 compares the labour efficiency of the boat builders against a standard of 100.

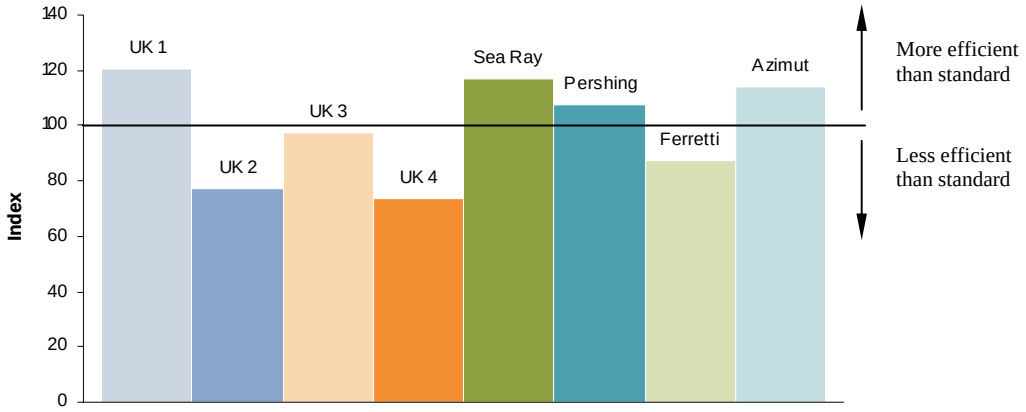

Figure 21: Labour efficiency index.

UK 2 and UK 4 with Ferretti are below the labour efficiency standard while one of the UK builders and Sea Ray have higher than standard efficiency together with Azimut and Pershing. When the labour efficiency index is plotted against NVA per FTEE, as shown in Figure 22 below, a poor overall relationship emerges – as it does with a Value Added comparison which gives a correlation factor of 0.18.

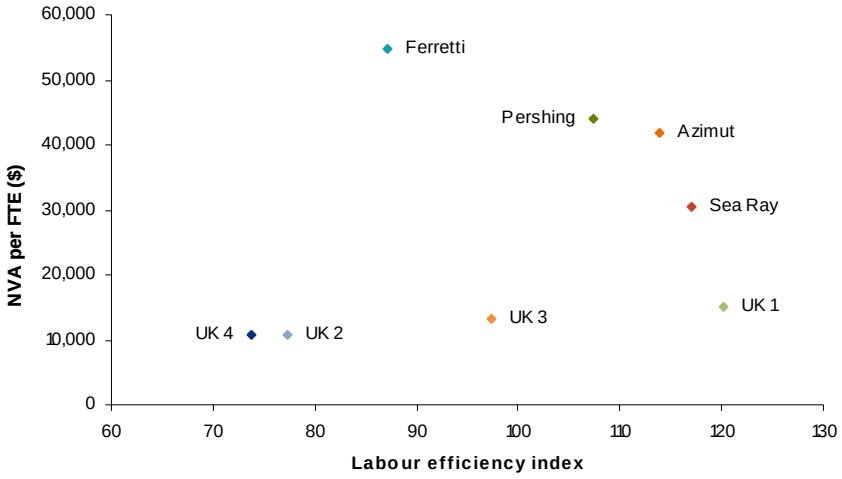

Figure 22: Net Value Added per FTEE against Labour efficiency index.

However, looking at the UK figures alone, there is a positive relationship between labour efficiency and Net Value Added. This is as would normally be expected and results from

the UK companies having relatively similar and lower Value Added productivities. The negative relationship apparent in the non-UK brands is counter-intuitive and is probably explained by the much higher pricing productivity levels of these brands.

The ratio of direct to indirect staff was examined to see if this had any influence on Net Value Added per FTEE. Figure 23 below shows the split between the direct workforce and indirect workforce, based on FTEEs, for the boat builders.

Direct staff are those directly involved in the production of output. Indirect staff includes personnel in non-production departments including for example sales and marketing, accounts, HR departments, procurement and general management.

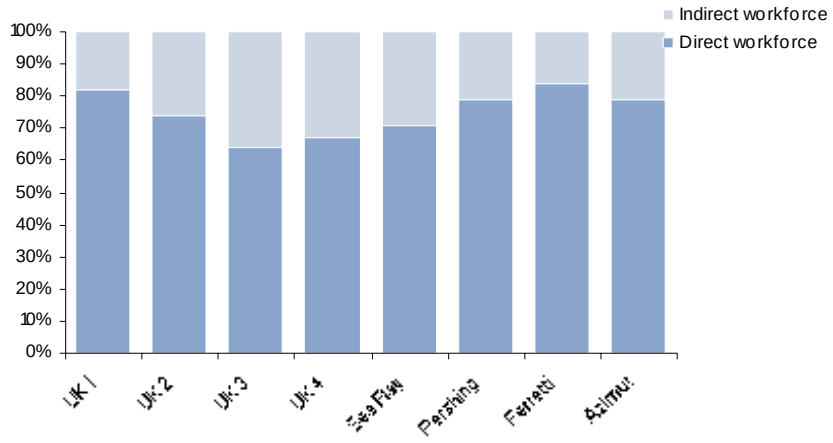

Figure 23: Breakdown of workforce (direct labour and indirect labour).

Figure notes:
(a) The UK data was obtained from interview programme
(b) Italian and US data from company information and industry interviews

The direct workforce as a percentage of FTEEs for all the boat builders ranges from 64% to 84%. The direct workforce percentage was then plotted against NVA per FTEE to see if any relationship emerged. This is shown in Figure 24.

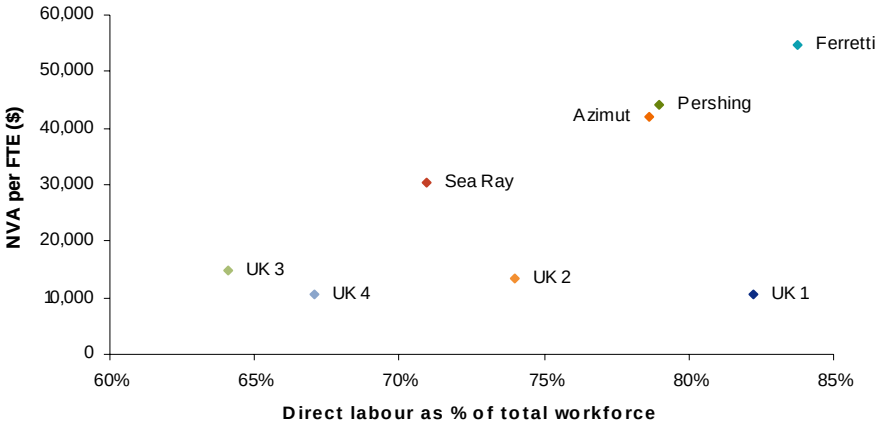

Figure 24: Net Value Added per FTEE against % of direct labour.

Figure notes:
(a) The UK data was obtained from interview programme
(b) Italian and US data from company information and industry interviews

The graph does indicate that there is some relationship showing that NVA per FTEE tends to increase as the direct workforce as a proportion of the workforces increases for the US and Italian brands, suggesting that Net Value Added increases as the level of overhead support (indirect labour) is minimised.

This relationship seems not to apply to the UK brands. The figures for the UK companies would appear to show no relationship between directs as a percentage of FTEEs and the NVA per FTEE.

6.5 Capital intensity and productivity

Capital intensity in terms of the total assets per FTEE is shown in Figure 25. Ferretti has significantly more assets per employee. However, Ferretti is part of a larger group so it is difficult to isolate assets attributable to the boat building business, particularly as the company is categorised by the group as a commercial and property company and the majority of the reported assets are intangibles.

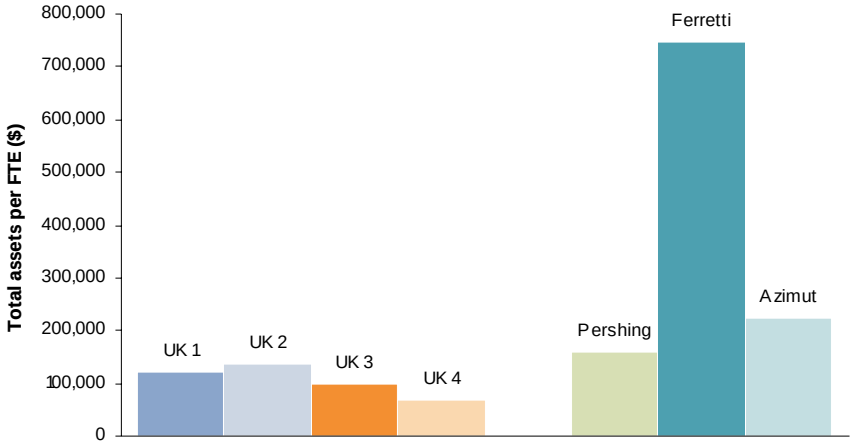

Figure 25: Capital Intensity.

Figure notes.
(a) Data obtained from company accounts
(b) No information is available on Sea Ray capital

Total assets per FTEE range from $66,000 to $222,000, excluding Ferretti. Azimut has 1.6 times the number of assets per FTEE than UK 2, the most capital intensive UK builder. This appears to support the information that the Italian builders have invested more in production technology than the UK builders.

The relationship between capital intensity and Value Added per FTEE is shown in Figure 26.

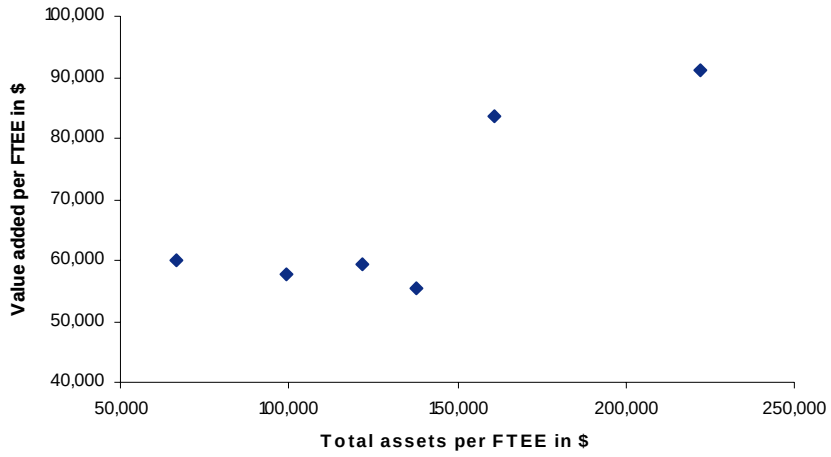

Figure 26: Capital intensity against Value Added per FTEE

This shows that the Italian brands of Pershing and Azimut have a higher level of assets and a higher level of generated Value Added than the UK brands which have a similar level of Value Added to each other but significant differences in the level of assets.

Capital productivity, measured by generated Value Added as a percentage of total assets, is shown in Figure 27. This shows that in general the UK companies deliver a higher capital productivity than the Italian brands with the leader being UK 4 at 90%. In contrast, UK 2 delivers around a 40% return which is in line with Azimut and Pershing. The Ferretti figure is again anomalous.

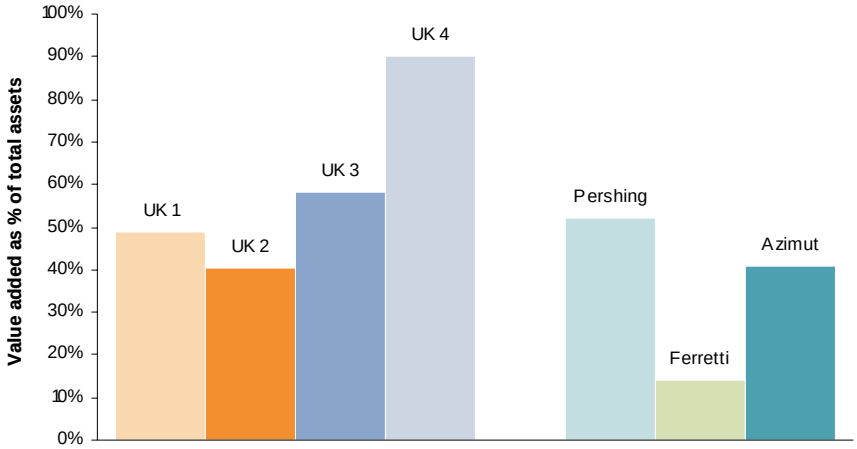

Figure 27: Capital productivity

The relationship between total assets per FTEE is compared to the direct labour hours per tonne in the graph below, where a very small degree of correlation suggests that investment in technology may explain greater efficiencies. This may strengthen over time as technologies become more developed and embedded.

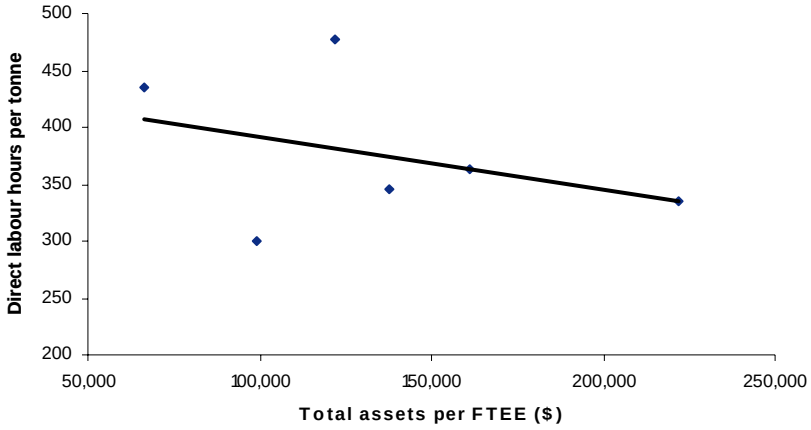

Figure 28: Total assets per FTEE compared to direct labour hours per tonne.

Figure notes.
(a) Total assets per FTEE obtained from company accounts and data collection
(b) Direct labour hours per tonne for UK builders from site visits and interviews
(c) Direct labour hours per tonne for IT builders from accounts and industry reports
(d) Ferretti's total assets per FTEE have been excluded from this graph

6.6 Typical cost structures

The analyses throughout Sections 6.2 to 6.5 have shown the existence of relationships between pricing, materials and labour to the average size of boat produced measured by dry weight or length. The basic relationships show that as the weight or length of the average boat produced increases, the revenue generated per tonne increases, but so do the costs of materials and direct labour which makes up the majority of total employment costs.

The combination of these results goes some way to answering the question whether the better performance of the Italian brands against the measures of Value Added per FTEE or return on Sales is simply because they build bigger boats on average. The individual results were shown in Figure 12, Figure 16 and Figure 20. These can be combined into a single Typical Cost Structure (TCS) which shows the expected Value Added and contribution to profits and how it varies by boat size.

This TCS is summarised in Table 21. Two boat sizes have been chosen to illustrate the key messages: one at 13.1 tonnes and one at 26.2 tonnes. The lower value has been selected because it is approximately equal to the average boat size built by Sea Ray and UK 1 as shown in Table 16, and the higher value because it is an approximation for the average boat sizes of Azimut and Pershing, and at double the lower size makes comparisons easier. The illustrative boats are synthetic constructs based on the average of all the brands, i.e. a standardised output. Their characteristics are derived from the econometric estimation of the relationships between input costs and boat length, as illustrated by the trend lines in Figures 16 and 20.

	Illustrative boat 1	**% of revenue**	**Illustrative boat 2**	**% of revenue**
Average length of boat (LOA)	45		59	
Average weight of boat in tonnes	13.1		26.2	
Revenue generated in $	589,881		1,327,249	
Cost of materials in $	*249,718*	*42.3*	*705,615*	*53.2*
Cost of other goods and services in $	*62,795*	*10.6*	*186,739*	*14.1*
Total cost of BIGS in $	312,513	52.9	892,353	67.3
Value Added in $	277,368	47.0	434,896	32.8
Cost of direct labour in $	102,677	17.4	227,804	17.2
Other costs and profit in $	174,691	29.6	207,092	15.6

Table 21: Typical Cost Structure by size.

This table shows that revenue across the two boat sizes increases by about 122% when the boat size rises by 100%. However, the total cost of bought-in goods and services

increases even more and rises from about 53% of total revenue to about 67%. The effect is that while the total Value Added generated increases, it increases by only 57%, which is significantly below the increase in boat weight. Direct labour costs increase in line with revenues. What this means is that the Value Added generated per tonne on the smaller boat is about $21,170, and this falls to $16,600 per tonne for the larger size boat.

Figure 29 shows for a standardised output, the TCS calculations for revenue, bought-in goods and services and generated value added across the range of boat lengths covered by the average size of boats built by the 8 brands. This shows the Value Added generated increases to a peak at about a 65 foot boat length, but then declines in absolute terms.

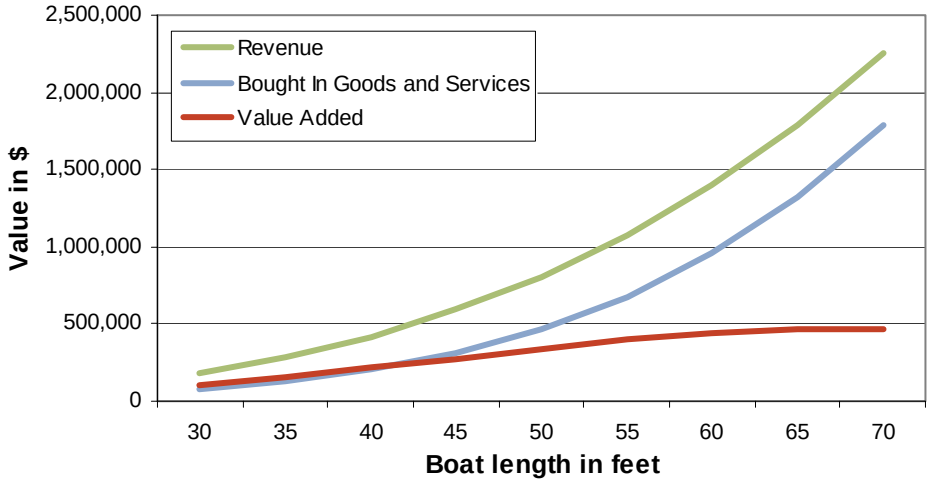

Figure 29: Value Added generation by boat length

As a percentage of the revenue generated, Value Added declines across the size range as shown in Figure 30, from about 60% at 30 feet to 20% at 70 feet.

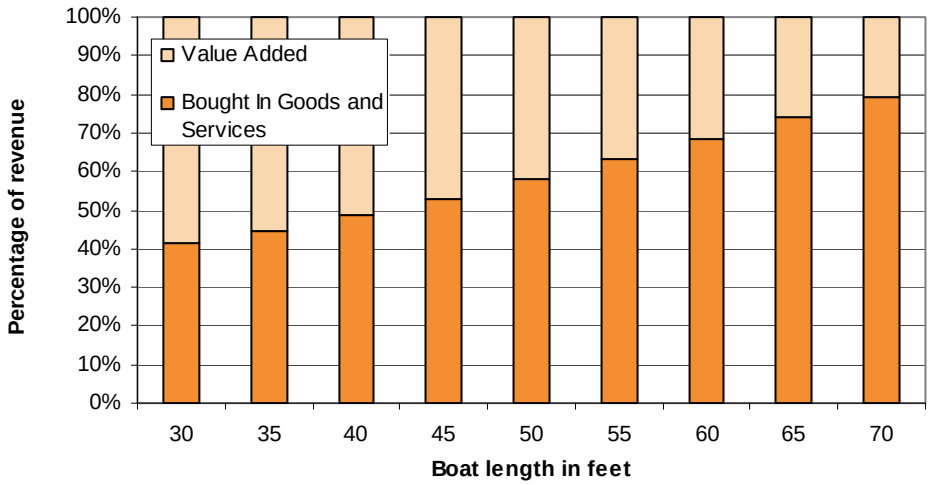

Figure 30: Value Added as a percentage of revenue

From a company profit perspective, the impact is even greater with the indications that direct labour costs increase with boat sizes, as shown in Figure 31.

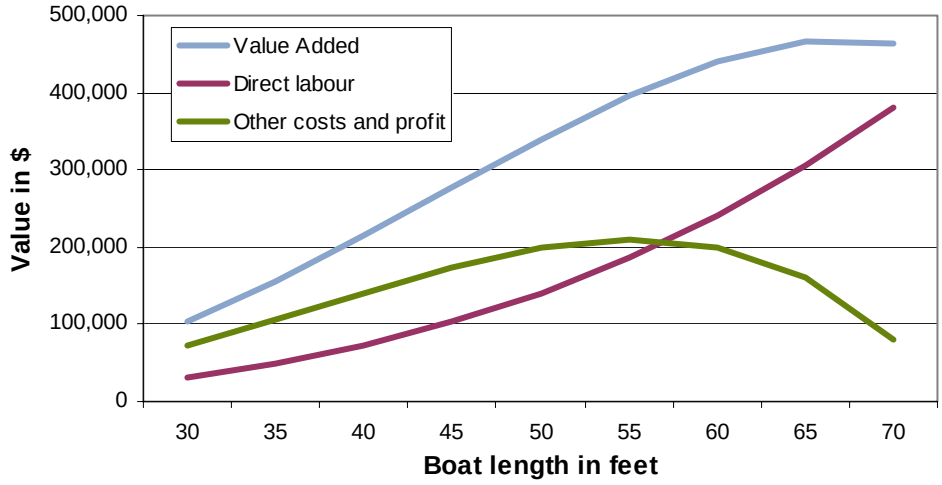

Figure 31: Value Added and direct labour costs by boat length

The Typical Cost Structure model appears to show that there is no intrinsic advantage in building larger boats – in fact unless other efficiencies and productivities can be generated, the smaller boat market may be more attractive. This result seems to differ to the earlier results that showed the Italian brands which build larger average size boats generate higher levels of Value Added and profits per FTEE[34]. That both results can hold

[34] As does the American Sea Ray although its boats are much smaller.

can be seen by: $\frac{VA}{FTEE} = \frac{Sales}{FTEE}\frac{VA}{Sales}$. This shows that Italian boatbuilders can have both relatively high VA/FTEE and low VA/Sales if FTEE/Sales is relatively low. One reason for this is that Italian boatbuilders have a higher capital intensity, i.e. have substituted capital for labour to a greater extent than in the UK.

The simple comparison of VA/FTEE was not based on the standardisation of outputs utilised to analyse the relative brand performance against the indices of price productivity, materials efficiency and direct labour efficiency as summarised in Table 22.

Brand	Country	Materials efficiency index	Direct labour efficiency index	Price productivity index
Ferretti	Italy	98	87	124
Pershing	Italy	69	107	123
Azimut	Italy	121	114	100
Sea Ray	USA	n.a.	117	93
UK 1	UK	92	74	91
UK 2	UK	89	97	75
UK 3	UK	124	120	77
UK 4	UK	97	77	93

Table 22: Labour, materials and price efficiency by boat builder

The Typical Cost Structure model needs to be interpreted carefully. The results on how revenues per foot increase with boat size are based on data about specific boats, whereas the results on how costs per foot increase with boat size are based on average costs at specific boatbuilders (they did not release cost data on individual models). There is therefore a risk that the TCS approach reveals how Value Added varies by boatbuilder rather than by size. This would mean that the estimation of VA per foot for the larger boat sizes could be biased by factors specific to Italian boatbuilders.

That costs per foot are higher for larger boats could be due to (a) something about the complexity or difficulty of building bigger boats, or because (b) Italian builders use labour less efficiently, or (c) use labour efficiently but need more labour to achieve the higher levels of functionality, luxury or design intensity that they prefer. In other words, it may possible for UK boatbuilders to build larger boats at a lower cost per foot than the data on Italian boatbuilders would suggest.

Although this cannot be ruled out, it is less plausible to argue the alternative hypothesis that VA/Sales or per foot could be higher for larger boats. It is more likely that in order to compete at the large boat end of the market UK boatbuilders would also have to incur these higher costs.

It is not implied in this discussion that UK boatbuilders should maximise VA scaled by FTEE or Sales or per foot. Nor does it mean that Italian or UK boatbuilders should build smaller boats. Instead they should pursue normal business objectives of maximising profitability as measured e.g. by the Return on Capital Employed and to at least cover their Cost of Capital.

The point of this analysis is to show that the superior financial performance of the Italian boatbuilders is not due to building bigger boats per se. It is because they are able to charge a price premium, and because of greater labour productivity due to capital investment. If UK boatbuilders want to compete in the larger boat segment, they would need to improve their price performance and labour productivity through investment in competitiveness factors discussed in the next chapter. However, the priority areas for improvement may well differ between the brands depending on the weight of boat produced, and the impact of issues such as the level of innovation, labour skills, processes and technology will vary across the brands because of the differences in boat sizes.

7 Drivers of Competitiveness

This section looks at the extent to which differences in price or input productivity might be explained by differences in innovation, investment, skills, or the supply chain. It looks at the drivers of competitiveness in four key areas:

Section 7.1	Innovation and R&D
Section 7.2	Skills and processes
Section 7.3	Investment
Section 7.4	Competitiveness and the supply chain

The results in this section are limited by the lack of availability of overseas data, but there is some evidence that the Italians lead in product design, brand positioning and customer awareness. They are more investment intensive, have a lead in the adoption of high technology, e.g. robotics, resin infusion, and are more capital intensive. There is no evidence that UK builders lag in the adoption of lean techniques, or that they have been disadvantaged by ownership structures, or levels of state aid

7.1 Innovation and R&D

Interviews with dealerships and boat builders[35] put forward innovation as a potential reason why brands achieve a clear premium in terms of revenue per tonne. Therefore, spend on research and development (R&D) was analysed, however more limited data was available for Sea Ray and the Italian brands. The Figure compares R&D spend as a proportion of sales revenue for the UK boat builders.

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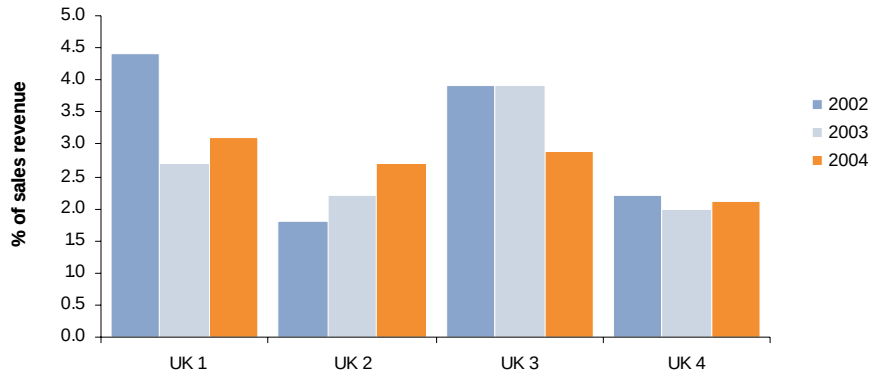


[35] "Innovation drives product sales. It really does." George Buckley, CEO Brunswick Group – Marine CEO June 2003

Figure 32: R&D spend as a percentage of sales revenue.

Figure notes.
(a) The data was obtained from interview programme

Two of the UK boat builders spend relatively large amounts on research and development. Interestingly these manufacturers have the longest time to market, measured as the time from initial concept to completed production of the first model.

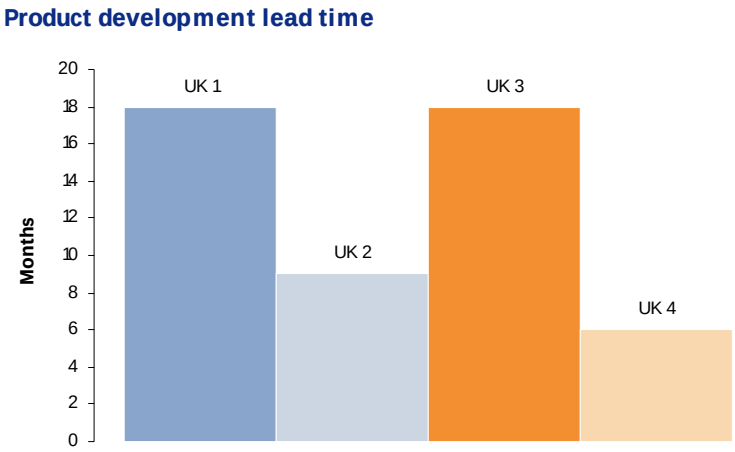


Figure 33: Product development lead time.

Figure notes.
(a) The data was obtained from interview programme

It should be noted that time to market will be affected by supply chain capability. Supplier involvement in research and development is increasing, with the suppliers often initiating activity[36]

The success of product development can be ascertained by examining income from products released within a year, see Figure 34. The figures are relatively consistent across UK builders, although there is a slight downward trend.

[36] As reported during telephone survey with suppliers

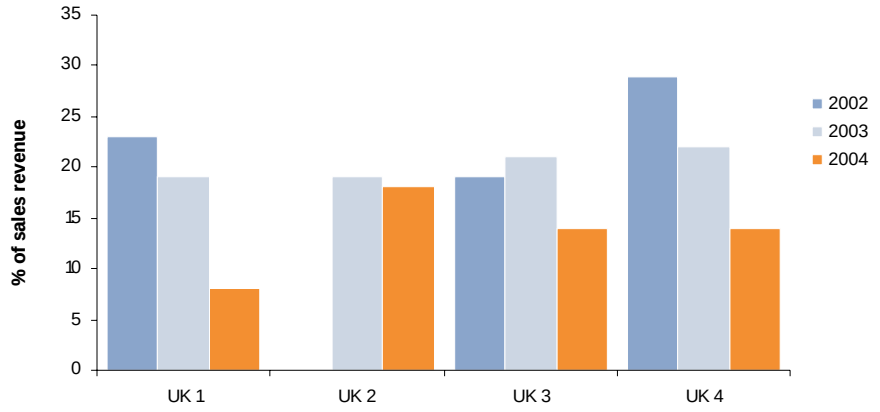


Figure 34: Percentage of sales revenue from products launched within a year.

Figure notes.
(a) The data was obtained from interview programme
(b) UK 2 did not supply data for 2002

All the UK builders recognised the need to improve product development times and were at various stages in improving their new product development process. The requirement for a new product was usually identified by senior managers who based their decision on a combination of feedback from customers and dealers, boat show visits, and intuition on the market. Little formal risk analysis was undertaken by most of the UK boat builders in relation to new product development. All the boat builders stated that design and style were key to the customer's purchase decision.

Detailed information on R & D spend at Sea Ray is not available. At Boat Segment level within the Brunswick Corporation, total R & D expenditure was 1.2% of revenue in 2004, a decline from the level of 1.6% reported for 2002 and 2003. The Sea Ray division has a central R & D facility at the Merritt Island site in Florida employing 251 designers. Assuming employment costs are as the average for the whole brand, this indicates an R & D people cost at 1% of revenue. This aligns with the 1.2% for the total Boat Segment allowing for costs of goods and services. The forward strategy for the Boat Division places significant emphasis on new product launches (with 15 new Sea Ray models scheduled for this year), better integration of equipment rather than the current approach of fitting post-manufacture, and design improvement "to compete with the emerging competition from Italian boat builders[37]."

The information for Italian yards is even less clear. Azimut-Benetti does not report expenditure on R & D. Ferretti Group claims to invest 12% of revenue on new products. The Group has a centralised Engineering Division and Centre for Research & Development at Forli with an estimated 180 employees supplying services for all group

[37] Cynthia Trudell, Sea Ray Boats Group President

brands. Again using average employment costs, this equates to about 2.5% of group revenue.

The Italian industry does rate design leadership very highly as a factor in competitiveness. This is supported by national programmes such as the Master in Yacht Design programme sponsored by the Ministry of Infrastructure and Transport (Pleasure Boat Department) together with UCINA, As.Pro.Na.Di (national association of pleasure boat designers) as well as partners in the boating industry. The MYD course is run at a number of universities such as Politecno di Milano and Frederico II University of Naples which have established dedicated wind tunnels and model basins for designer training.

Italian yacht designers appear to be increasing their influence over the market. For example, Fulvio di Simoni, the design house for Pershing, signed an agreement with leading Spanish boat builder Rodman to design a new range of flybridge motor yachts from 35 feet to 105 feet. Similarly, Carver Yachts, a subsidiary of Genmar, the second largest American boat builder, has recently opened a yard in Italy in order to be able to access and learn from Italian yacht designers.

7.1.1 Assessment of the sector group position on innovation

With the exception of Sea Ray, the leisure boatbuilding sector would appear to qualify as an R&D intensive sector. The average level of investment in R&D was about 2.6% of revenue in 2004, and this was the lowest level in the UK over the last 3 years. The range for individual brands was from 2.0% to about 3.1%, so that overall the sample returned a level higher than the 2.4% DTI threshold for categorisation as an R&D intensive sector.

7.2 Skills, process and quality

7.2.1 Skill levels

Skill levels and training are known to affect productivity. The data on skills was limited to UK boat builders. Brand level data for Sea Ray was not available and the Italian boat builders' data was difficult to ascertain and was complicated by their high level of subcontracting. An examination of training spend for UK boat builders was undertaken, see Figure 35.

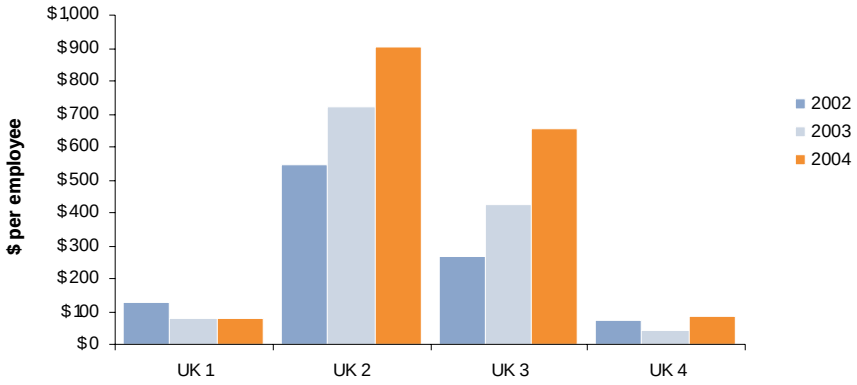


Figure 35: Training spend per employee.

Figure notes.
(a) Data obtained from interview programme
(b) Comparative data from the US and Italy was not available

UK 3 is making a concerted effort to raise skill levels in Information Technology and Lean manufacturing. A number of builders have established links with regional colleges that appear to be satisfying training needs. However, research[38] suggests that training provision should be improved by linking public and private sector training providers and business to provide a networked form of provision.

Training hours per employee is reasonably consistent across UK boat builders, ranging from 15 to 30 hours allowance a year.

Difficulty in obtaining skilled staff was reported by the majority of builders and suppliers and the shortage was thought to affect productivity. The approximate percentage of staff educated to NVQ levels 2 – 4 is shown in the graph below. UK 4 appears to have the highest percentage of staff with NVQ level 2. However, most of the builders had difficulty finding this data, and estimates were made.

[38] Skills Needs of the Marine and Maritime Sector in the South West of England, Executive Summary to the Final Report' (July 2003), Social Research and Regeneration Unit and Marine Science and Technology, University of Plymouth.

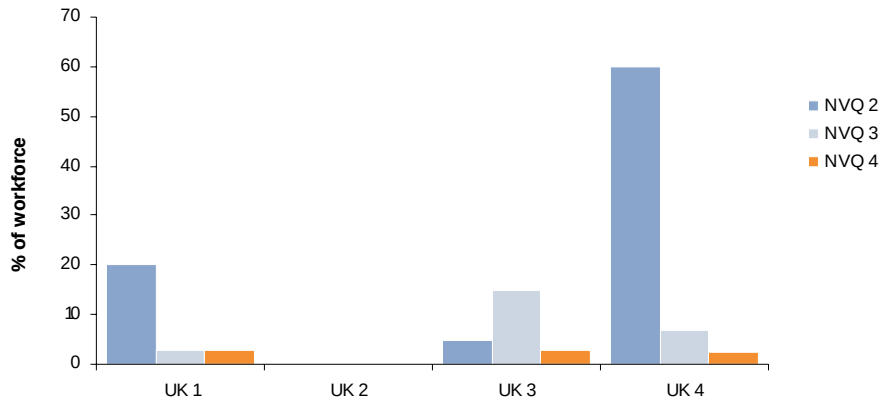


Figure 36: Approximate skill levels (NVQs).

Figure notes:
(a) This data is approximate since many boat builders did not have exact figures available
(b) Comparative data from the US and Italy was not available

Comparative data on the level of qualifications in Italian and American companies is not available. Reference has already been made to the Master of Yacht Design programme in Italy. The Brunswick Boat Group has established what it sees as key partnerships with the University of Tennessee and other institutions to supply its growing need for engineers, managers and supervisors.

7.2.2 **Lean**

Lean is a proven technique from the automotive industry that improves performance without excessive expenditure. Its aim is to drive out wasteful activity so that time spent 'adding value' is maximised.

Stock turns provide a guide to how 'lean' an organisation is. The higher the figure, the better the control of raw materials, work-in-progress and finished goods indicating lower levels of working capital. Figure 37 shows stock turns by manufacturer.

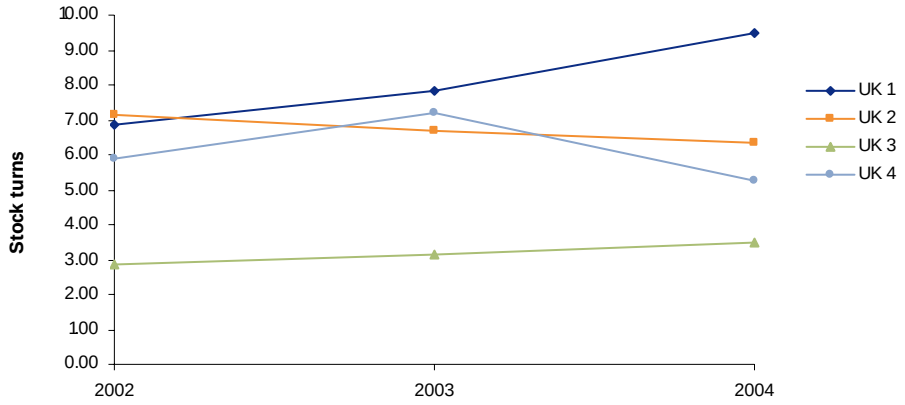


Figure 37: Stock turns of the UK boat builders.

Figure notes.
(a) data obtained from interview programme
(b) data from company accounts did not match since dealers stock was included
(c) note that the identification of boat builders remains constant through this section for comparative purposes

The comparative stock turn figures for the Italian companies are: 5.9 for Pershing and 4.7 for Ferretti which are broadly comparable with UK 2 and UK 4. Specific figures for the Azimut brand are not available but the level for the Azimut-Benetti Group as a whole has been below 4 in recent years. No specific information is available for Sea Ray's larger yachts.

UK 1 has high stock turns suggesting that its processes are comparatively 'lean'. UK 3 has the lowest stock turns of the data set, but certain parts of its plant stood out in terms of lean. An analysis of stock in UK 3 is shown in Figure 38.

Figure 38: Stock status in UK 3 as a percentage of total stock.

Figure notes.
(a) data obtained from interview programme

By way of comparison, the stock status in UK 1 is analysed in Figure 39.

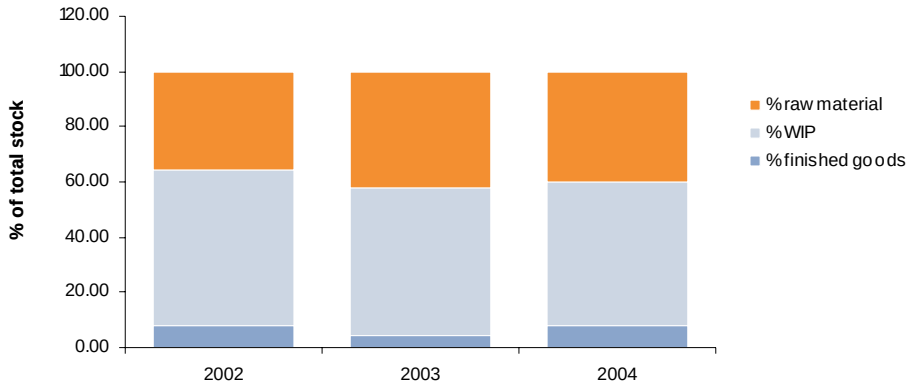


Figure 39: Stock status in UK 1 as a percentage of total stock.

Figure notes.
(a) data obtained from interview programme

It can be seen that UK 1 holds significantly less finished goods stock, as a proportion of total stock holding. This is significant since finished goods stock is the highest value stock in any manufacturing business. This suggests that UK 3 produces more than the customer demands and therefore has to hold the finished goods stock. UK 1 in contrast, builds to order so finished goods stock is low. In terms of 'lean' UK 1 is demonstrating best practice by minimising the worst of all wastes – overproduction.

World class automotive suppliers in the UK typically operate between 80 and 100 turns. A figure of less than 12 is considered poor in most industries, although differences will exist as a result of the type of product processed. The low volumes and long lead times of the boatbuilding industry mean that they are unlikely to achieve significant stock turns; however they will be able to improve their turns through the adoption of lean practices.

7.2.2.1 *Lean rating*

Each of the UK builders was scored from 1 to 10 in respect of lean during the site visits (criteria are shown in Appendix C). The scores are shown in Figure 40.

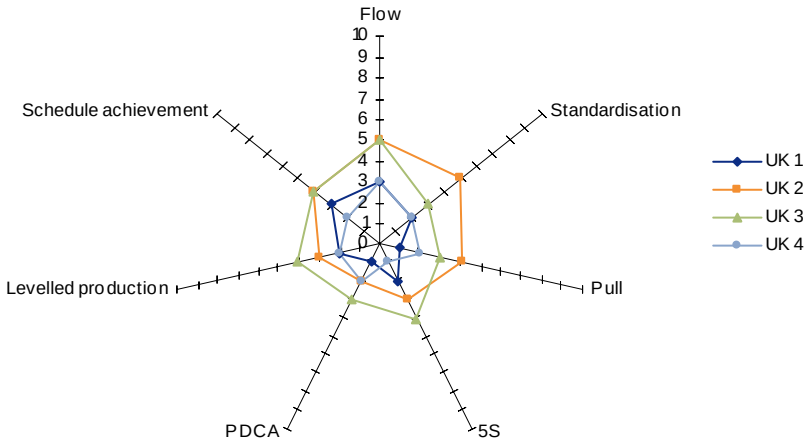


Figure 40: Lean rating - UK boat builders.

Figure notes.
(a) data obtained by inspection of facilities during site visits

The relatively high score for standardisation and pull for UK 1 underlines the findings of the stock analysis. It should be noted that UK 3 had one production line that was exceptional in terms of lean. However, the majority of the plant was average.

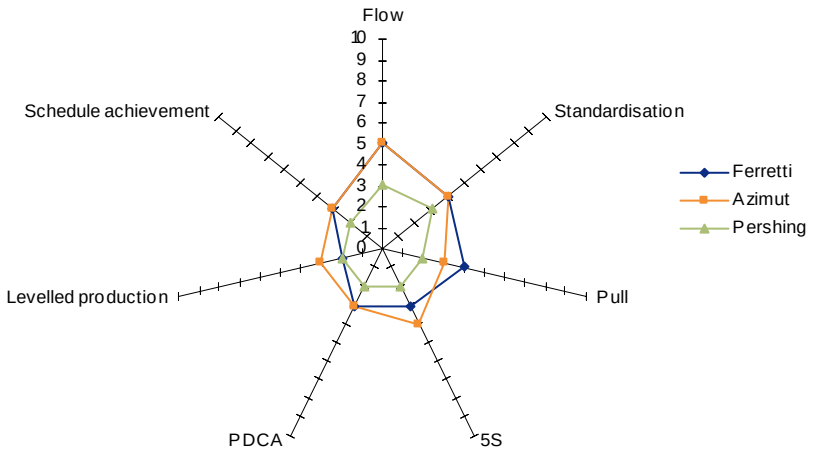


Figure 41: Lean rating - Italian boat builders.

Figure notes.
(a) data obtained from web-sites and Phil Draper's industry reports

The lean rating of Italian plants is not as accurate as for the UK since the plants were not visited first hand. However, there was nothing on web-sites or in the literature search or in discussions with industry players that suggested they were any more advanced than the better plants in the UK from a lean perspective.

In broad terms, the boat building industry would be positioned somewhere behind the aerospace and automotive industries in respect of lean.

An improvement in the development of lean processes is seen as key by UK companies and skills are being transferred into the companies from the automotive sector. The same situation is occurring in Sea Ray.

The quantification of the impact of lean processes is difficult at the moment because their adoption is at the early stages, but overall there is a positive correlation co-efficient of 0.65 between the ratings for lean for the boat builders in the sample and the labour efficiency index as shown in Figure 21. This indicates that further progress towards lean processes will deliver advantages in lower labour costs.

7.2.3 **Quality**

Warranty costs show the magnitude of quality problems experienced by customers. In turn this will give an indication of quality problems at the boat builder. Warranty costs as a percentage of sales are shown in Figure 42.

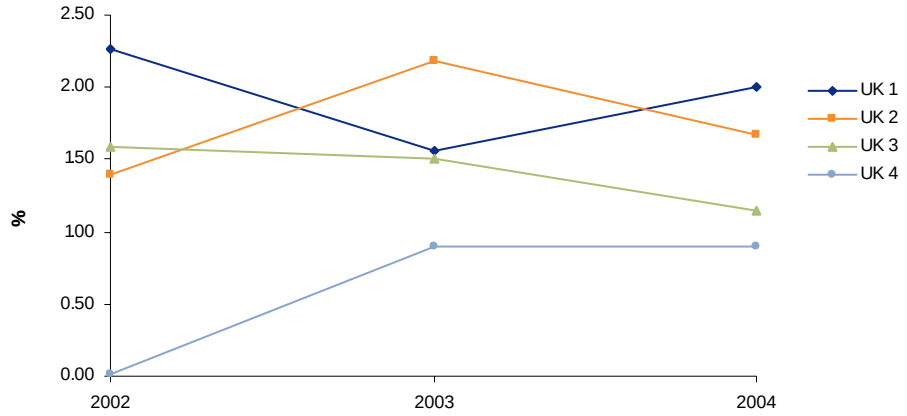


Figure 42: Warranty costs as a percentage of sales.

Figure notes.
(a) data obtained from interview programme
(b) warranty costs were unavailable for Italian and US builders

UK 4 exhibits low warranty costs in relation to sales. Internally the factory had a slightly greater focus on producing right first time, but the lower warranty costs may equally be a result of better pre-customer checks.

7.2.4 Procurement practices

Procurement practices will affect cost and hence competitiveness. All the UK boat builders commented that there was a trend towards more 'professional' purchasing in the industry. A range of practices were observed during the investigation. The best companies considered the total cost of acquisition, ran vendor rating systems and employed internal KPIs, whilst others operated more simplistic purchasing processes. However, all of the builders were looking to reduce the number of vendors, improve delivery, cost and quality performance of vendors, develop better vendor assessments and work more closely with suppliers to improve competitiveness through long standing formal relationships. Make versus Buy decisions do not appear to be made in a formalised, objective manner. Unfortunately, it is difficult to isolate the effect of these practices. Often companies with good procurement practices were good in other areas.

7.3 Investment

Investment has been reviewed in three ways: capital expenditure and investment intensity, the use of technology, and the role of state aid.

7.3.1 **Capital expenditure**

Capital expenditure for the 2004, with the exception of Azimut which is for 2003, is examined in Figure 43 below, where Azimut has a significantly greater capital expenditure per FTEE than the other builders.

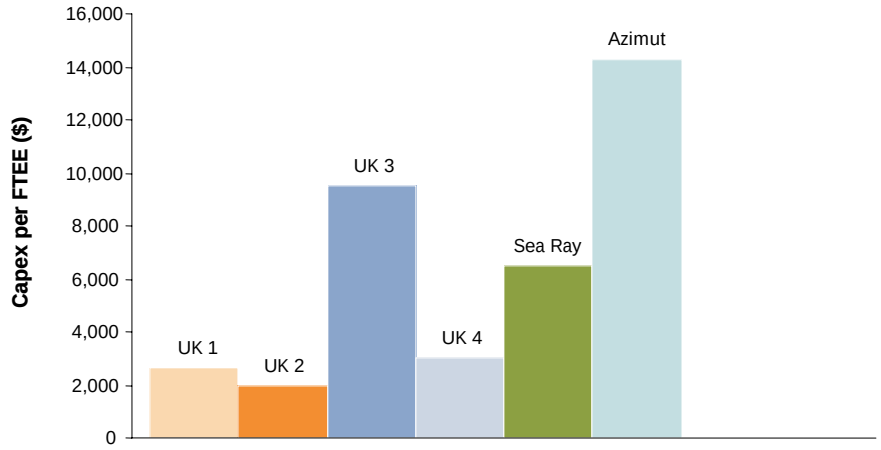


Figure 43: Capital expenditure.

Figure notes.
(a) Data obtained from company accounts and websites – data for the year under review is broadly in line with previous years for all six brands

As with R & D, detailed information on Sea Ray's capex is not available. At Brunswick Boat Segment level, capex has varied between 2.4% and 2.9% of revenue since 2002. The main emphasis of capex spend in 2003 was on tooling for new models, and efficiency and quality improvement projects. The 2004 spend was focused on new model tooling, the expansion of the Bayliner plant at Reynosa and acquisition associations. Using a level of 2.5% for the Sea Ray brand, this suggests a total capex in 2004 of $24 million, just under $7,000 per FTEE.

In 2005, Sea Ray is planning a $22 million investment at the Tellico plant, mostly in extending closed moulding technology and use of robotics. This is targeted to double production levels but will only impact boats up to 22 feet in length.

Azimut-Benetti has reported a consistent investment/capex level of 6% of revenue since 1998. This excludes acquisition costs. This level is forecast by the group to increase significantly in 2005 to around 13% because of the refurbishment of the Orlando site for the Benetti mega-yacht brand. Pre-2004, there has been significant investment in upgrading the Turin manufacturing plants and the Savona quayside. Turin is now said to be at capacity and unlikely to be expanded because of transport problems on larger boats

with the motorway bridge heights towards Savona. Group emphasis seems to have moved more to expanding in the mega-yacht segment with the formation of the joint venture and shared production with Fincantieri, and the acquisition and development of marinas and harbours in the La Spezia area.

The Ferretti Group has been investing significantly in upgrading its manufacturing facilities, with an indicative figure of €45 million in 2004, equivalent to 8% of Group revenue. This includes part of the €12 million investment in the Mondolfo yard for Pershing, € 26million at La Spezia for the Riva brand plus group launching facilities, and an undisclosed amount for a new boatyard at Cattolica for the Ferretti yacht brand. The group is also investing a total of €55 million at Torre Annziata near Naples to support the Apremare brand.

This high-level of investment is said to be part of IPO strategy[39] by Permira Private Equity, the major shareholder, which is rumoured to be scheduled within the next two to three years.

The top level view of investment intensity shows Ferretti and UK 1 with relatively high measures of investment intensity as shown in Table 23. Both companies would qualify as 'capex intensive' in the DTI Value Added Scoreboard having capex values in excess of 5% in 2004. Sea Ray and the other UK companies have significantly lower ratios. Comparative information is not available for either Azimut (no specific R&D information) or Pershing, though Pershing would be expected to be similar to its sister company of Ferretti.

Brand	**Investment intensity** Ratio of (R&D + capex) to (total cost of employees)
Ferretti	0.53
Sea Ray	0.21
UK 1	0.29
UK 2	0.15
UK 3	0.15
UK 4	0.11

Table 23: Investment intensity.

7.3.2 The impact of ownership structures

In an R&D intensive and high growth sector, access to investment funding could be a factor in the relative competitiveness of the brands and companies involved. The ownership structure of the individual brands during the period of this review is shown in Table 24. This shows that the overseas brands were all part of public corporations or had significant shareholdings held by financial institutions. In contrast, 3 of the 4 UK brands were privately owned, though one has subsequently been subject to a management buy-out supported by a venture capital company.

[39] Phil Draper, IBI May 2004

	UK brands	Italian and US brands
Public corporations	1	1
Finance houses and private individuals		3
Private companies	2	
Private individuals	1	

Table 24: Ownership structures.

There would appear to be little direct relationship between the investment intensity measure shown in Section 7.3 and the ownership structure as shown above. For example, the highest investment intensity ratio in UK companies is for the privately owned company and the lowest is for the public corporation subsidiary. The Italian groups have had an investment intensive strategy in recent years, but this is said to be linked to a possible change in ownership.

Overall, there is little evidence that ownership structures have significantly constrained the competitiveness of the individual brands.

7.3.3 Technology

Technology is a key driver of productivity. For instance resin infusion moulding appears to offer significant productivity benefits over traditional techniques, and is starting to be taken up by yacht manufacturers. The effect of this and other technologies is assessed in this section.

The level of technology for UK builders is plotted in Figure 44.

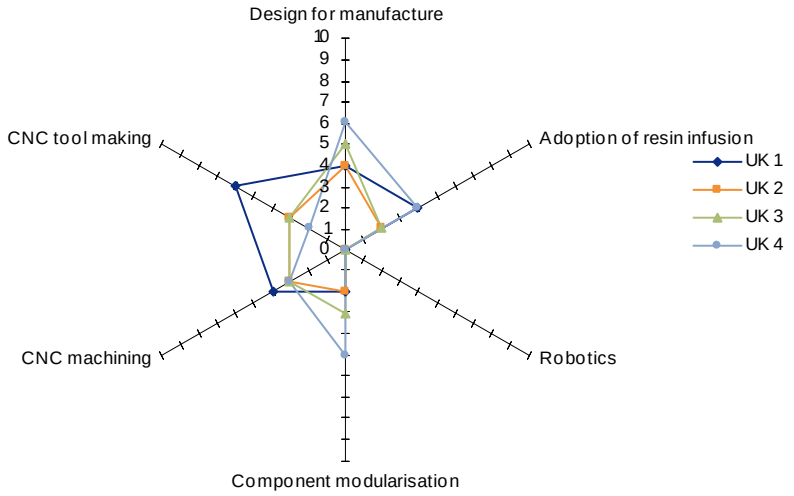


Figure 44: Technology rating - UK boat builders.

Figure notes.

(a) Data from observation during site visits

The level of technology at the Italian builders is shown in Figure 45.

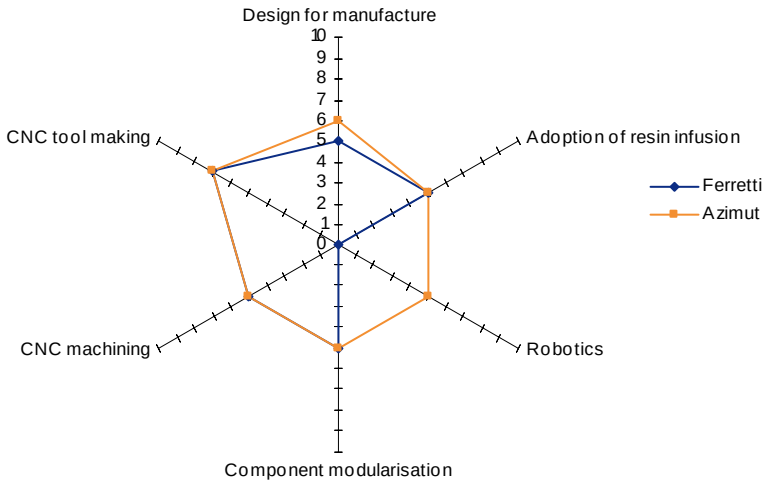


Figure 45: Technology rating - Italian boat builders.

Figure notes.
(a) Data from web-sites

Of note, is the fact that Azimut uses robots to spray gel over moulds; the only builder in the survey with this technology. This builder also employs advanced CNC tool making equipment. The funding for Ferretti's investment in technology appears to have come from private equity and generated capital[40]. Although the US has not been scored as data was not available, it is known that Brunswick uses robots and closed moulding on smaller craft (up to 22 ft) at its Tellico plant. Furthermore it is carrying out a Lean Sigma improvement initiative.

[40] Draper, P, 'High Flying', European Boat Builder, February 2004

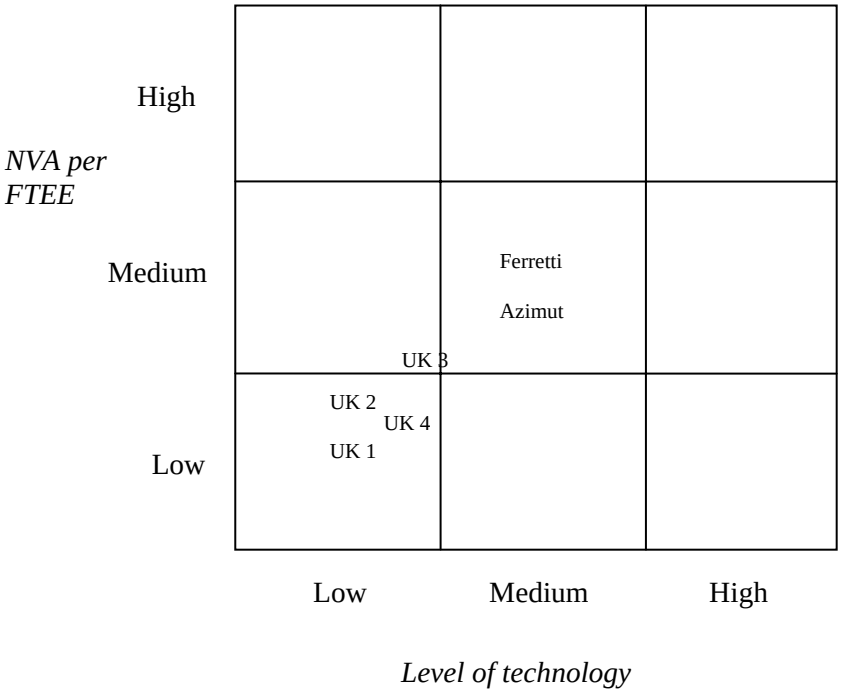


Figure 46: Technology compared to NVA per FTEE.

Figure notes.
(a) UK data obtained from site visits and interviews
(b) Italian data taken from web-sites

Figure 46 shows that the Italians have a higher level of technology and greater labour NVA per FTEE.

Overall, there appears to be a relatively low correlation of 0.36 between the technology ratings for the individual brands and the materials efficiency index shown earlier in Figure 17. However, this result is heavily skewed by one UK company which appears to have a high materials efficiency but a relatively low level of technology. Excluding this company, the correlation result for the other brands increases to 0.9 suggesting that use of appropriate technology has a clear relationship with lower costs of materials.

The correlation between technology ratings and labour efficiencies is similarly impacted by the UK company. Overall the correlation is very low at 0.11, but for the sample excluding the UK company it rises to 0.53. This is still a relatively weak connection but does provide some evidence of a benefit from the increased use of technology.

7.3.4 **The role of State Aid**

State aid across Europe is controlled by European Commission protocols though the general level of support to manufacturing industry in Italy is approximately twice that in the UK.

Two of the four UK manufacturers have received significant state aid to support investment in technology and facilities in recent years and this is still being amortised in the company accounts.

The map showing the regions qualifying for state aid is much more complex in Italy than the UK and in establishing the boundaries, more coastal areas and particularly ports have been included. As with the UK, obtaining robust information on the full provision of state aid to individual companies is difficult.

The Azimut yacht brand manufacturing facilities are outside the qualifying areas and there is no indication that recent investment has been supported by state aid. The position is very different on the harbour and marine projects within the broader Azimut-Benetti Group which are believed[41] to have received significant levels of aid.

The position with the Ferretti Group is different because of the different locations. The La Spezia and Naples yards have received significant support in state aid – but these do not produce either the Ferretti or Pershing branded yachts. A firm figure for the amount has not been obtained but industry sources[42] indicate a value of about 20% of the total investment, made up in part by direct grants and in part by tax deferments.

The American position is structurally less clear, although individual grants of state aid are more transparent. The Brunswick Boat Segment received a cash grant of $3.5 million when it moved its HQ from Chicago to Knoxville in 2001. More currently, the $22 million investment in the Tellico plant will receive state aid[43] to a value of about $4 million from a number of sources. These include $0.7 million from the State of Tennessee, about $2 million from Knoxville and Monroe Counties through tax freezes, technology grants and job tax credits, about $1 million from Tellico Reservoir Development Agency for skills enhancement and to expand Tellico West Corporate Training Centre, and an unknown amount from Tennessee Valley Authority for capital investment, employment and wages.

In summary, a number of the brands in all three countries reviewed have received state aid in the recent past to support investment in facilities and job creation. However, the study has not identified any evidence that differences in the levels of support have been sufficient to impact overall competitiveness.

[41] Paolo Vitelli, President Azimut-Benetti Group, Italiano Superyacht 494
[42] Ministero della Infrastrutture e die Transporto and Ferretti Group Company Profile, Feb 2005
[43] Knoxville Area City Partnership

7.4 Branding

The focus of this study has been on the supply side and measurable attributes of outputs and inputs, but some of the unexplained brand premia could be due to differences in brand positioning, distribution systems, and possibly local demand conditions.

Only one of the UK manufacturers questioned in this study demonstrated evidence of brand positioning and could clearly articulate a broad set of brand values encompassing how the company is positioned or is aiming to be positioned against its competitors. The Pershing and Ferretti brands command a clear premium in terms of revenue per tonne. This is because (a) they sell a higher proportion of larger boats, (b) their prices for a given size are significantly higher. This premium would appear to be supported by the quality of their product design, but also a better understanding or relationship with the customer base, partly driven by stronger knowledge of the HNWI customer base because of the group involvement in mega-yachts and other segments, and partly by a greater focus on market research and customer 'ownership' rather than delegating customer management entirely to the dealerships.

7.5 Competitiveness and the role of the supply chain

7.5.1 Supply chain SWOT

An analysis of the boat building supply chain was undertaken. Telephone interviews were conducted with a range of suppliers who provided components and materials to the boat builders, including engines, electronics, glazing, composites, propellers and stern gear, exhausts, tanks and bow thrusters. The interviews covered the following topics: interdependence, innovation, supply chain efficiency, finance, skills and market overview. The data gathered from the interviews highlighted the following strengths, weakness, opportunities and threats for the UK sector.

Strengths	high quality products; flexible and responsive to boat builders needs; low prices; co-development of products with builders; short time to market (suppliers and builders)
Weaknesses	low level of lean applied; lack of process measurement; low number of main customers giving little opportunity to spread risks; very few formal supply contracts in place; skill shortages
Opportunities	trend towards larger and faster boats; improved efficiencies in supply chain; modularisation of components (e.g. engines, exhausts, electronics, steering systems into one system); market is growing.
Threats	German and Italian builders growing market share; currency fluctuations; competition from Chinese suppliers; raw material shortages; emissions legislation; acquisition of supply chain by US builder; higher tax on fuel; varying prices throughout Europe (engines); consolidation in market may threaten smaller suppliers

Table 25: Supply chain SWOT (Strength, Weaknesses, Opportunities and Threats).

The findings of the telephone survey are used to discuss the supply chain in respect of:

- Level of competitiveness;
- Interdependencies between suppliers and boat builders;
- Level of integration;
- Impact of skills shortages;
- Maturity, volumes and flexibility.

7.5.2 Level of competitiveness of the supply chain

The supply chain is applying lean techniques to reduce costs and improve quality as well as delivery performance. In addition, research and development is increasingly being carried out in conjunction with suppliers. The most important requirement of a supplier (according to many of the suppliers interviewed) is responsiveness to the needs of the builders, where emergencies, such as stock shortages or design changes at short notice, need to be catered for.

Although the boat builders do not have long-term supplier development programmes, two builders have made use of a government funded programmes (SEEDA and SWRDA) to improve their supply chains.

Formal supply contracts were generally absent in the supply chain. This contrasts with the automotive industry where supply contracts are very detailed and comprehensive.

The boat building supply chain appears to be following the current trend to outsource manufacturing to lower wage economies. For instance, an electronics supplier is planning to outsource its manufacturing to a low wage economy, but intends to keep research and development, and sales in the UK.

Thus, the boat building supply chain displays some of the characteristics of a developed and competitive supply chain. However, certain aspects, such as formal supply contracts and supplier development are lacking. Unfortunately, a comparison to the Italian or US boat building supply chain is beyond the scope of this report, so we cannot determine comparative competitiveness.

7.5.3 Interdependencies between suppliers and boat builders

At present, there is little interdependency in the supply chain. For example, engines are purchased from one supplier and exhausts from another. However, as the supply chain develops, systems solutions will generate higher interdependencies.

In the automotive industry, modular or system solutions are common place. For example, Nissan purchase a dashboard module, incorporating steering column, radio and air conditioning in one unit. This approach reduces assembly time at the OEM and transfers cost through the supply chain.

An engine manufacturer in the boat building supply chain is taking the same approach by supplying an engine module which includes steering system, exhaust, electronics and gearbox. As with the automotive industry, there are significant cost savings. For instance, fitting time is reduced by 20%, management work load is reduced since less supplier co-ordination is required and semi-skilled labour can fit the module. In this instance, the success of the component suppliers will depend on the success of the module supplier. It may be significant that the boat builder moving quickest to adopt this technology is Rodman Polyships in Spain who are marketing the customer benefit as improved boat performance.

7.5.4 **Level of integration**

Brunswick demonstrates a high level of vertical integration, whilst the majority of the industry is horizontally integrated. Advantages of vertical integration include improved control and the ability to capture upstream and/or downstream profit margins. Disadvantages are potentially higher costs resulting from a lack of supplier competition, as well decreased flexibility since specialised assets are usually acquired.

Sea Ray is investing heavily in IT for a Supply Chain Data Warehouse and a Quality Data Warehouse to develop integration and economies in its supply chain. A partnership was formed with the AIMS company in 2004 to introduce a Quality Lifecycle management Framework which has delivered improvements of 30% in operating efficiency and the cost of quality in the automotive and electronics sectors. Similarly, a fundamental Brunswick strategy is to develop a vertical integration with entry into the boat parts and accessories business, probably through acquisition.

7.5.5 **Impact of skills shortages**

Skills shortages were reported by almost all of the suppliers. Furthermore, it was reported that skills shortages affect competitiveness. Generally, suppliers had difficulty sourcing shop floor skills, although IT skills were often quoted as being in short supply.

Furniture makers (i.e. carpenters) are difficult to source as they are able to earn a higher income in the house building sector. Lean skills are also in short supply and in demand in many other manufacturing sectors. A number of suppliers are carrying out training to improve this situation.

These findings are supported by another study[44], which showed that business management and engineering skills are particular problems. Specific shortages related to painting and finishing, welding and fabrication and carpentry and joinery. These skill gaps were reported to, ‘affect the competitiveness of the Marine and Maritime Sector in the Region’. It is highly likely that similar skill gaps exist outside of the South West of England.

[44] Skills Needs of the Marine and Maritime Sector in the South West of England, Executive Summary to the Final Report’ (July 2003), Social Research and Regeneration Unit and Marine Science and Technology, University of Plymouth.

7.5.6 **Maturity**

The boat building supply chain is not as mature as the automotive supply chain as demonstrated by low stock turns for example. The quality, cost and delivery performance of automotive suppliers is paramount since the low stocks held in the supply chain do not provide significant protection against supply problems. Thus, the boat building supply chain needs to improve its quality, cost and delivery performance before it can trim stock holding to similar levels to the automotive industry.

7.5.7 **Volumes**

The volumes of the automotive industry are significantly higher than in the boat building industry. Thus, capital expenditure is easier to justify in the automotive supply chain. However, low volumes are not a significant concern for glass, engines and electronics suppliers to the boat building industry since they often supply other industries and/or serve a world-wide market. However, specialised manufacturers of decking and furniture, for example, may find it difficult to purchase highly efficient plant and equipment since volumes are low.

7.5.8 **Flexibility**

Highly efficient plant and equipment is usually designed to produce a large quantity of a standardised product, resulting in less flexibility. Since the boat building supply chain needs to be flexible (see SWOT analysis in Table 23), a lack of capital expenditure may work in its favour, particularly during new product development where changes need to be made quickly in the run up to a boat show for example.

However, this is not to say that process improvement should be neglected. Lean delivers improvement without the need for high capital expenditure, or high volumes. Therefore, efforts should be made to increase the rate at which Lean is applied.

Appendix A – Definitions and glossary

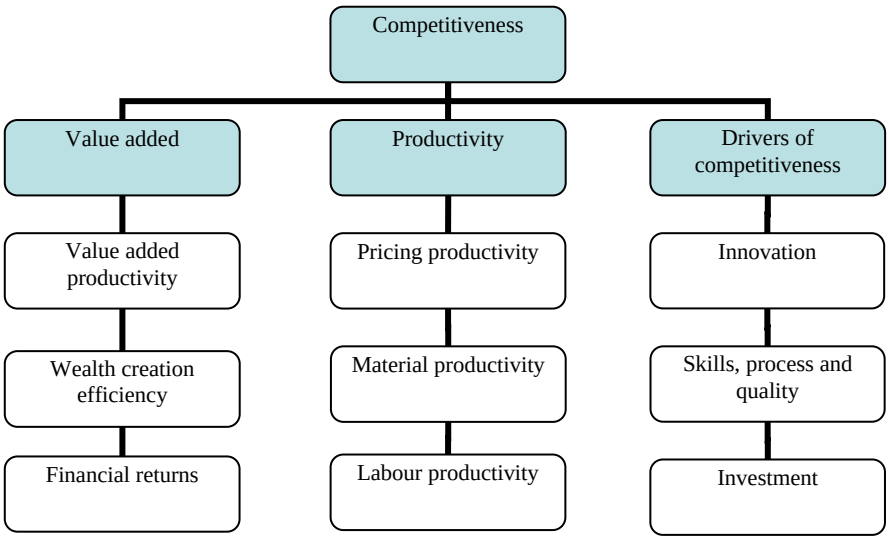
LOA	Length overall
Large Yacht	Approx 40’ to 80’ in length
Super Yacht	Approx 80’ to 130’ in length
Mega Yacht	Approx 130’ and above in length
Boat weight	Dry weight of the boat in tonnes. Used mostly in the form of an average for all boats produced by a builder
Unit output	One tonne of boat
FTEE	Full time equivalent employee – that is the total of employees and sub-contractors
Direct worker	Member of the workforce whose primary role is in processing materials for boat production
Indirect worker	Non direct worker. A member of the workforce whose primary role is in areas such as sales and marketing, accounts, human resources, general management, product design, research & development etc
Materials	Bought-in goods processed directly for inclusion in the finished product
BIGS	Bought-in goods (including materials) and services less the cost of sub-contract labour which is transferred to employment costs
Value Added (VA)	Revenue less the cost of bought in goods and services (BIGS)
Net Value Added (NVA)	Value Added less the cost of FTEEs; that is total employment costs and the costs of sub-contractors
Value added productivity	Value added per FTEE
Premium price	A revenue per unit output higher than the weighted average for the sample
Price productivity index	The ratio of actual revenue obtained per unit output compared with the weighted average for the sample
Materials efficiency index	The ratio of the cost of materials per unit output compared with the weighted average for the sample
Labour efficiency index	The ratio of direct man hours per tonne of output compared with the weighted average for the sample
HNWI	High net worth individual
RoS	Return on sales: operating profit as a percentage of sales

RoTA	Return on total assets: operating profit as a percentage of total assets
Capex	Capital expenditure
R&D intensive sector	Spend on Research & Development more than 2.4% of total revenue
Capital intensity	Total assets per FTEE
Capital productivity	Net Value Added as a % of total assets
Capital intensive sector	Where capex is more than 5% of revenue and depreciation more than 4.8%
Investment intensity	Ratio of (R&D + capex) to (total cost of employees)
Labour productivity	Net Value Added per equivalent FTEE. This includes employees and sub-contractors
Capital productivity	Net Value Added as a % of total assets
Wealth creation efficiency	Value added/(employee costs + depreciation)
Efficiency index	Comparison of the actual brand value with the weighted average for the available sample of brands where the average = 100 and weighting is related to the average tonnage of output
Revenue per tonne	Calculated average price after dealer discounts in $ per tonne for the average size of boat sold or produced
Direct man hours per tonne	Calculated direct hours required for the average size of boat sold or produced
Skills level	Rating based on the percentage of work-force at different NVQ qualification levels
Lean rating	Unweighted average of the individual ratings against the seven criteria for assessing the level of adoption of lean practices – see Appendix C
Technology rating	Unweighted average of the individual ratings against the seven criteria for assessing the level of technology in production – see Appendix C
Capital intensity	Total assets per equivalent FTEE

Appendix B – Analysis framework

Introduction

The analysis considers the aspects of boat building that affect competitiveness. The framework is set out as:



A number of detailed measures sit under each heading, they are explained below.

Value added measures

At a brand level, productivity is measured as:

- Total Value Added
- Value added per FTEE
- Wealth creation efficiency
- NVA as a % of net assets
- NVA per FTEE
- Return on sales
- Return on total assets

Productivity measures

Productivity is measured by calculating:

- Sales/Pricing productivity, considering:
  - unit sales per employee
  - revenue per tonne and per FTEE
  - relationship between weight and price
  - comparative brand prices
  - price productivity index

- Material productivity in respect of:
  - BIGS as a % of revenue
  - material cost per tonne
  - material cost per tonne compared to average boat weight
  - material cost efficiency index
  - Value added and BIGS

- Labour productivity in terms of:
  - direct labour cost per man hour
  - direct man hours per tonne
  - man hours per tonne against average boat weight
  - labour productivity index
  - workforce structure

Drivers of Competitiveness

Competitiveness is considered in terms of:

- Innovation, which addresses
  - research and development spend
  - time to market
  - income from new models released within one year

- Skills, process and quality, covering:
  - training spend and hours per employee
  - NVQ levels
  - stock turns
  - stock status
  - lean ratings
  - warranty costs as a proportion of sales

- Investment
  - Investment intensity
  - technology ratings
  - technology compared to NVA per FTEE
  - capital intensity
  - labour productivity against total assets
  - capex per employee

Appendix C – Definition of ratings for lean and technology

Lean rating grid

Area / score	0-2	2-4	4-6	6-8	8-10
Flow	• No/limited evidence of flow lines		• Some, high standard, flow lines in place		• Extensive use of high quality, balanced flow lines with consistent schedules
Standardisation	• No/limited evidence of work instructions		• Some evidence of detailed work instructions		• Full standardised work system in place and used as basis for improvement
Pull	• Customer demand not considered		• Takt consistently worked to with few problems		• Takt time recalculated, and line rebalanced effectively when required
5S	• No evidence of 5S		• Good 5S condition with end of shift checks		• Excellent 5S providing basis for TPM
Use of plan, do, check, act	• No measures used		• Some shop floor measures in place driving improvement activity		• Extensive use of shop floor measures to drive improvement activity
Levelled production	• Peaks and troughs in work load		• Fluctuations in customer demand averaged and production aligned		• Sales and manufacturing are aligned to deliver a level loading of work

Technology rating grid

Area / score	0-2	2-4	4-6	6-8	8-10
Design for manufacture	• No effort to reduce part count or consideration of ease of assembly		• Reduced fixings and ease of assembly considered		• Detailed analysis and application of design for manufacture principles with demonstrated savings
Adoption of resin infusion	• Open moulding employed (traditional techniques)		• Some use of vacuum bagging and closed moulding on small and large boats		• Extensive use of vacuum bagging and closed moulding on small and large boats
Robotics	• Robots not used		• Robots used in some relevant areas		• Robots in place, wherever appropriate, with high utilisation
Component modularisation	• No/limited efforts to minimise build time by using integrated systems		• Some integrated systems employed		• Thorough use of integrated systems wherever relevant (to automotive levels)
CNC maching	• No/limited use of Computer Numerical Control to produce components		• Some use of Computer Numerical Control to produce components		• CNC maching used extensively throughout plant to produce components
CNC tool making	• CNC not used to develop moulds		• Some use of multi-axis CNC machines to produce moulds		• Extensive use of CNC machines to produce moulds

Grid notes

(a) Definitions for ratings are based on 'milestones'. Intermediate ratings are given for intermediate assessments.

Appendix D – Developing understanding of price premiums

The study has shown significant differences between the brands in the level of prices achieved in the market place relative to the size of the boat produced, as well as differences between achieved prices and the level of materials used.

Detailed evaluation of the reasons for these differences was not covered by the scope of the project, although the industry participants interviewed have put forward a consensus view on the reasons.

The ability to obtain premium prices is a significant explanation of the higher levels of Value Added per FTEE achieved by the non-UK companies, and consideration should be given to further research to develop a better understanding of the drivers of this performance.

A standard approach to this would be to undertake consumer research. However, there are particular features of this market which create significant constraints including:

- the small size of the sample base. The total number of international consumers is around 5,000 a year which makes it difficult to construct a statistically robust sample;
- the nature of the consumer base. The market is made up of high net worth individuals and in most luxury markets, for example automotive, experience shows that it is very difficult to get the participation of this customer group in market research other then through representatives.

An optional approach adopted in parallel markets would be to use intermediaries, in this case the dealerships. However, the interviews we have had suggest that the knowledge level of the majority of dealers is probably not sufficient on which to base such a project.

A practical approach could have the following stages:

1 A co-operative project involving the four leading UK companies

2 The development of a matrix for measuring differences in functionality and quality between different boats. The UK companies already benchmark against their competitors on this basis and the main activity here will be to synthesise the different approaches

3 Carry out research among recent customers of the UK companies to identify the priority and weightings involved in their choice of brand and boat type.

Clearly this is not the optimal approach, as it excludes customers who made a positive choice of an Italian or American brand without the buy-in of those companies. However, it is probable that buyers from UK brands have evaluated the competitors and developed their own methodology for comparative assessments. This approach would identify that process and the Key Performance Indicators for the customer group.