

# **Manufacturing SMEs in the Post-recession Business Environment**

**key messages for a sustainable business**

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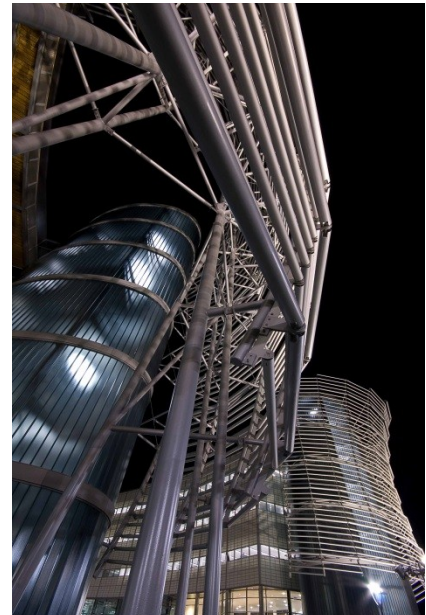
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Newcastle Business School, part of Northumbria University at Newcastle, initiated to carry out a self-funded study on the impact of the 2008 economic downturn on UK-based manufacturing SMEs.

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Research in Business and Management is one of the fastest growing and most challenging fields of scholarly activity at Newcastle Business School. Newcastle Business School’s research activity is conducted across a wide range of related subject disciplines, working in partnership with organisations and professional bodies to support them in achieving their business and management development strategies.

The researchers of the study and authors of this report Dr Eustathios Sainidis, Dr Andrew Robson and Dr Graeme Heron are academic staff of Newcastle Business School sharing a genuine interest in UK manufacturing. Graeme has extensive experience in delivering research projects commissioned by the European Commission’s European Regional Fund and Defra, whilst Andrew made a significant contribution at the start of the millennium on the regional competitive project. Eustathios has a strong research interest in manufacturing strategies for SMEs and was tasked to collect and analyse the data collected for the purpose of this report.

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## **Executive Summary**

The 2008 economic recession has been documented as the longest and most complex downturn in modern times for the British economy. Extant published professional and academic research on the subsequent *new* business environment has mainly focused on larger organisations failing to recognise the industry and market pressures now facing small-medium enterprises (SMEs<sup>1</sup>). The gap in knowledge of post-recession management practices is even more evident for UK manufacturing and in particular its SMEs sector. Our initial research of the relevant literature revealed significant knowledge gaps in recessionary and post-recession management practices in the UK SMEs sector.

This research report acknowledges the importance of informing manufacturing SMEs' managers and public policy bodies on the post-recession business environment now challenging UK manufacturing.

The findings of the study are based on primary data collected from an online survey of 104 UK manufacturing SMEs and 17 follow up interviews. Its research method combining survey and follow-up interviews offers the advantage of establishing a unique and sound overview of the emerging phenomenon at the same time, complementary depth and insight into the reasons underlying the behaviour of British manufacturing SMEs as a result of the post-2008 economic downturn, and its subsequent volatile and uncertain business environment. The collected data has been subject to analyses which are well established and accepted within the Business and Management research community.

The report starts with a brief review of the macro-environmental business factors of UK manufacturing before, moving to the discussion of the research findings. The lessons from this discussion suggest a realignment of the competitive manufacturing priorities relevant to British manufacturing SMEs, initiated by senior management within in the sector, accounting both for sectoral conditions and associated market response.

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<sup>1</sup> EU recommendation 2003/61 definition of SMEs: < 250 employees, ≤ £42 million turnover.

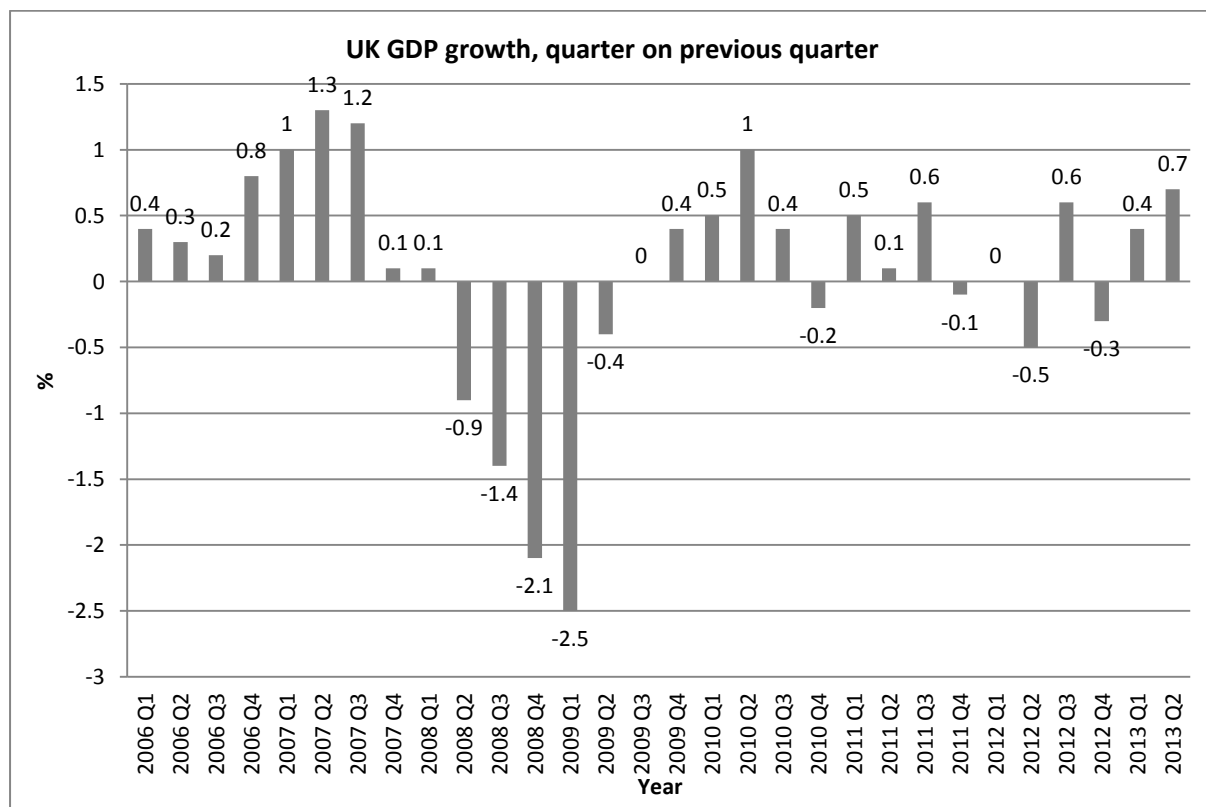
## Contents

1. Background .....	1
2. Rationale for the study .....	2
3. Study objectives .....	3
4. Survey and interview respondent profile .....	4
4.1. Survey sample .....	4
4.2. Interview sample .....	7
5. Study Findings .....	9
5.1. Manufacturing priorities .....	9
5.2. Manufacturing costs .....	12
5.3. Human resources .....	15
5.4. Role of the business functions .....	16
5.5. Industry developments for manufacturing SMEs .....	19
5.6. Frequency of manufacturing strategy review .....	22
5.7. Impact of Government policies on manufacturing SMEs .....	23
5.8. Market developments .....	24
6. Conclusions .....	25
References .....	28

## 1. Background

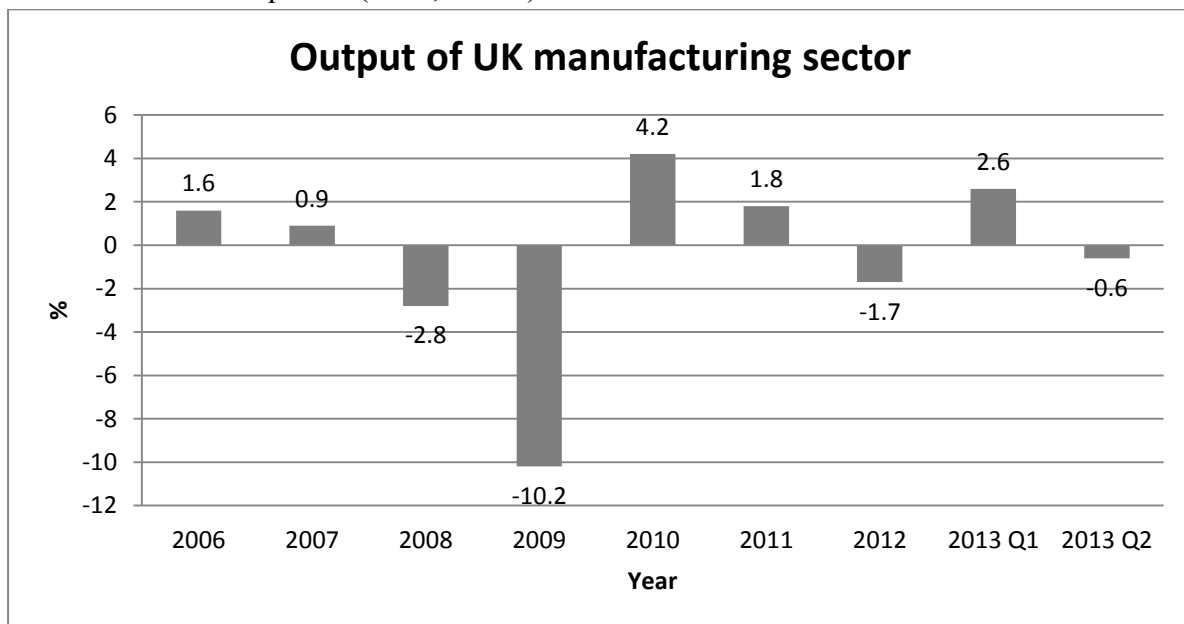
Ahead of the 2008 recession, few experts from business, academia and Government forecast its arrival or impact, although a small minority sounded warnings around private debt levels in the UK. Further afield, the International Monetary Fund (IMF, 2006) provided positive forecasts for economic growth on a world scale, a message supported by various intra-governmental bodies. Consequently, Governments, businesses and individuals were ill-prepared for a downturn unparalleled in the modern era for its length and complexity.

The initial UK signal for economic slowdown, the first after year-on-year economic growth for 16 years, was provided by Sir Mervyn King in the September 2007 report to the Treasury Committee. This report made the link between financial crisis and subsequent UK economic slowdown (Bank of England, 2007), although its warnings were countered by on-going confidence for another twelve months. This optimism effectively ceased when the Office for National Statistics (ONS, 2008a) reported a 1.4% contraction in the UK economy through its data report in the third quarter of 2008. Even greater shrinkage of UK economy, 2.1%, was reported in the subsequent quarter, signally that the UK economy had entered recession (ONS, 2008b). The growth in the UK economy thereafter, as indicated by Figure 1, was relatively small in percentage terms with the economy almost experiencing a second recession towards the end of 2011. During 2013, a more positive picture has emerged, indicated by economic growth of 0.4% and 0.7% in quarters 1 and 2 respectively, with the International Monetary Fund (IMF, 2013) forecasting an overall growth of 1.4% for 2013 and 1.9% for 2014.



**Figure 1 - UK economy GDP trend 2006- 2<sup>nd</sup> quarter 2013 (source: ONS)**

Added to the trend exhibited by GDP on the previous page, UK manufacturing output from the 2008 downturn onwards displayed significant diminution, shrinking by more than 10% in 2009 and declining by a further 1.7% in 2012, albeit in the intervening time period providing a relatively strong recovery, as presented in Figure 2. For this sector, there appears to be a year-long time lag relating to both demand and output with respect to the major contractions in the overall UK economy that occurred respectively in 2008 and 2011. More recently, the UK manufacturing sector has exhibited volatile growth with measures published in July 2013 suggesting a 2.6% growth in production output in the first quarter of 2013, but a decline of 0.6% in the second quarter (ONS, 2013a).



**Figure 2 - Output of UK manufacturing sector 2007 – 2<sup>nd</sup> quarter 2013 (source: ONS, 2013a)**

## 2. Rationale for the study

Relative to previous periods of economic difficulty, the 2008 global downturn has delivered greater uncertainty to nations, industrial sectors and associated organisations. The level of globalisation differentiates this recessionary period from that of the mid-1970s, whilst market restructuring, in particular the movement of industrial growth from the established economies of the USA, Western Europe and Japan to their emerging counterparts including Brazil, Russia, India and China (BRIC countries) has further differentiated these two periods of economic difficulty.

Experiences drawn from the recession are numerous and varied, with SMEs because of size, being constrained financially and managerially in assessing and planning for the resultant business environment changes (Kitching *et al.*, 2009). Their ability to diversify as a counter to risk is also limited, given their smaller and more greatly focussed customer base and product range (Smallbone *et al.*, 2012), although in the 2008 recession, UK manufacturing proved to be reasonably robust in the face of recession relative to its international counterparts primarily through favourable exchange rates (BDO, 2009).

The UK is ranked sixth in global terms for its manufacturing base and is relatively advantaged in terms of high-tech manufacturing products (UNCTAD, 2010), with relative dominance across a range of sectors including organic chemistry, biotechnology, pharmaceuticals, defence, aerospace and medical equipment, but facing challenges from a global perspective in sectors such as electronics and information technology (BIS, 2010b). The importance of manufacturing in the UK is further reinforced by its contribution to employment, comprising around 2.6 million people or 10% of the workforce, with recent growth being exhibited (ONS, 2013b). Across various sectors, SMEs contribute £1.5 trillion in turnover and provide work for 42% of those employed in the UK (Engineering UK, 2012). Recognition of manufacturing's role in contributing to a balanced economy is arguably demonstrated through various policies covering investment in innovation and exports and support for new SMEs developments, skills and training, finance, exporting and safeguarding energy supply (BIS, 2010a).

Although sales confidence, exports and employment levels are exhibiting signs of growth, despite challenges around cash flow, inflation and labour costs (BCC, 2013), there is embedded volatility relating to the UK's manufacturing output. This vulnerability, endorsed through modest growth forecasts, is further worsened through squeezes on investment by Government and business leading to a weaker recovery compared with that enjoyed by the UK's G7 counterparts. In turn, UK consumer spending is relatively modest, with domestic household saving ratios increasing from 0.2% in 2008 to 8.6% in 2009 and 4.2% in quarter one of 2013 (ONS, 2013c). The macroeconomic picture is particularly complex, with the Office for National Statistics (ONS) referring to the "*productivity puzzle*", where trends in GDP display little correlation with either unemployment or productivity levels (ONS, 2012). The "*puzzle*" centres on a significant decline in GDP post-2008, yet only a relatively small unemployment increase, followed by actual unemployment decline during 2012 and into 2013<sup>2</sup>, with productivity level diminution either in real-time or lagged, exhibiting limited correlation with GDP figures. One notable difference from previous recessions is organisational "*labour hoarding*", where maintenance of staff resourcing at levels that is comparable to those pre-recession offers organisations the potential to develop and realise opportunities in the latter time period (FT, 2013).

### **3. Study objectives**

This study provides an understanding of how radical changes to the business environment have affected UK-based manufacturing SMEs. This new environment represents the time period from 2008 to present, defining the 2008 economic recession as the "*structural break*" that distinguishes the recent past from an earlier period of time which was not subject to volatile and uncertain industry and market structures. The study contributes to the practice manufacturing strategy in SMEs by pursuing the overarching research question:

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<sup>2</sup> At the time of writing (October 2013) UK unemployment stood at 7.7% (ONS, 2013d).



*How has the 2008 UK economic crisis impacted on the manufacturing strategy of UK-based manufacturing SMEs?*

Answers to this particular question are provided by giving specific attention to how the 2008 UK-economic recession has impacted on manufacturing SMEs' strategic considerations of:

- Manufacturing priorities (defined in terms of delivery performance, quality, cost, flexibility, supply base, product range, process technology and green manufacturing).
- UK-based human capital.
- Organisational support.
- Available UK government support.
- Industry and market developments.

The practical and contemporary setting of this study provides practical managerial insight that is of potential interest to manufacturing SMEs' senior managers and supporting public policy bodies. This is particularly interesting given the unique characteristics of the 2008 economic downturn comprising two deepening recessions, reduced productivity, but only relatively small increases in unemployment (ONS, 2012).

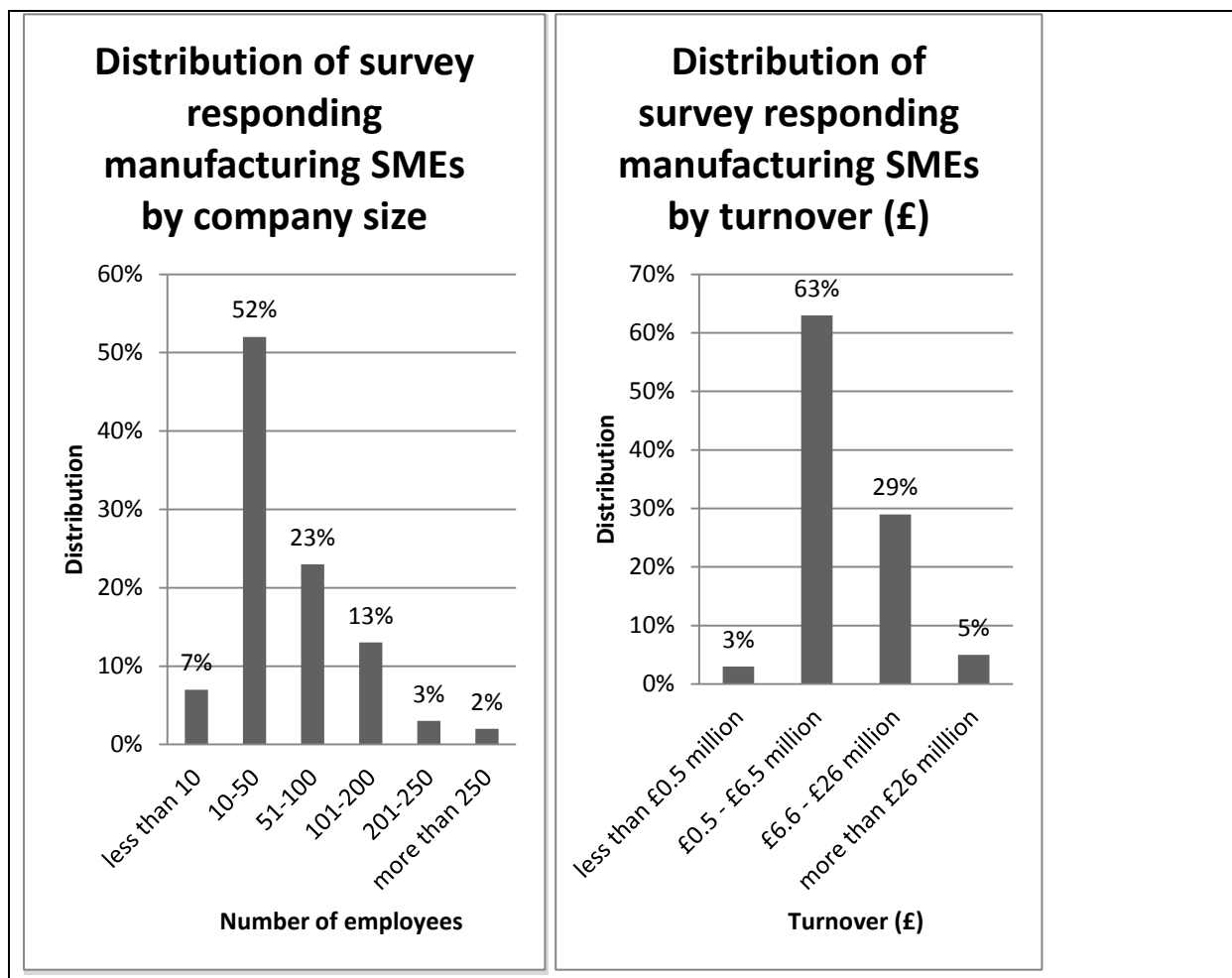
The study findings offer manufacturing SMEs' senior managers a framework on the post-recession business environment their organisation now operates in, signposting the industry and market changes expected to inform their manufacturing and business strategy, thus suggesting that lessons can be learned to improve performance and business sustainability.

## **4. Survey and interview respondent profile**

### **4.1. Survey sample**

This section presents an overview of the 104 survey participants and the 17 interviewees who took part in the study, all senior managers of UK-based manufacturing SMEs. Examination of the demographic data suggests company size, defined by number of employees on site, indicates a skew towards companies with 10-100 employees. Specifically, 8% of responding manufacturing SMEs employ fewer than 10 people (micro), 52% employ 10-50 (small), 22% employ 51-100 (medium), 13% employ 101-200 (medium), and 3% employ 201-250 people (medium). Regarding annual turnover, the majority of participating manufacturing SMEs are generating £0.5-£6.5 million, which is common for companies of this size. The size and turnover distributions are presented in Figure 3.





**Figure 3 - Distribution of survey responding manufacturing SMEs by company size and turnover (£)**

For ownership, 65% record being independent and 35% are a subsidiary or an operating unit of a group of companies. In terms of lifespan, most of the participating manufacturing SMEs are mature and well established. From the 104 participating manufacturing SMEs, 71 have a life of 20-30 years in business, with 11 over 100 years old and 22 less than 20 years.

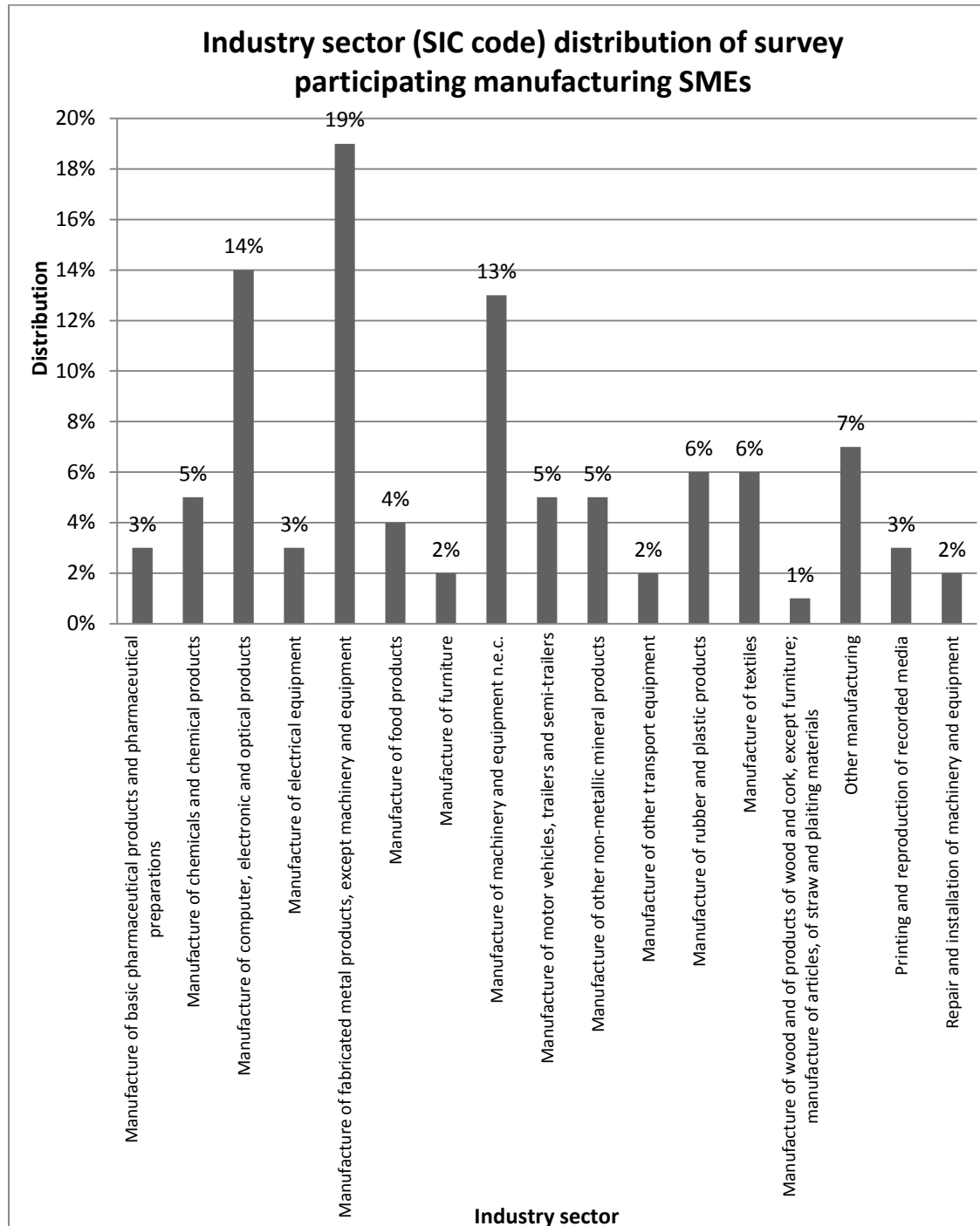
The majority operate under batch (53%) or job (40%) production modes, 27% employ a project production type and 13% a line process. A number of manufacturing SMEs in this study indicate that they operate by adopting a combination of these approaches.

Each of the 104 manufacturing SMEs was further categorised by SIC code (industry sector), the data shows three main industry sectors being represented:

- 19% operate in the manufacture of fabricated metal products (except machinery and equipment).
- 14% operate in the manufacture of computer, electronic and optical products.
- 13% operate in the production of machinery and equipment.

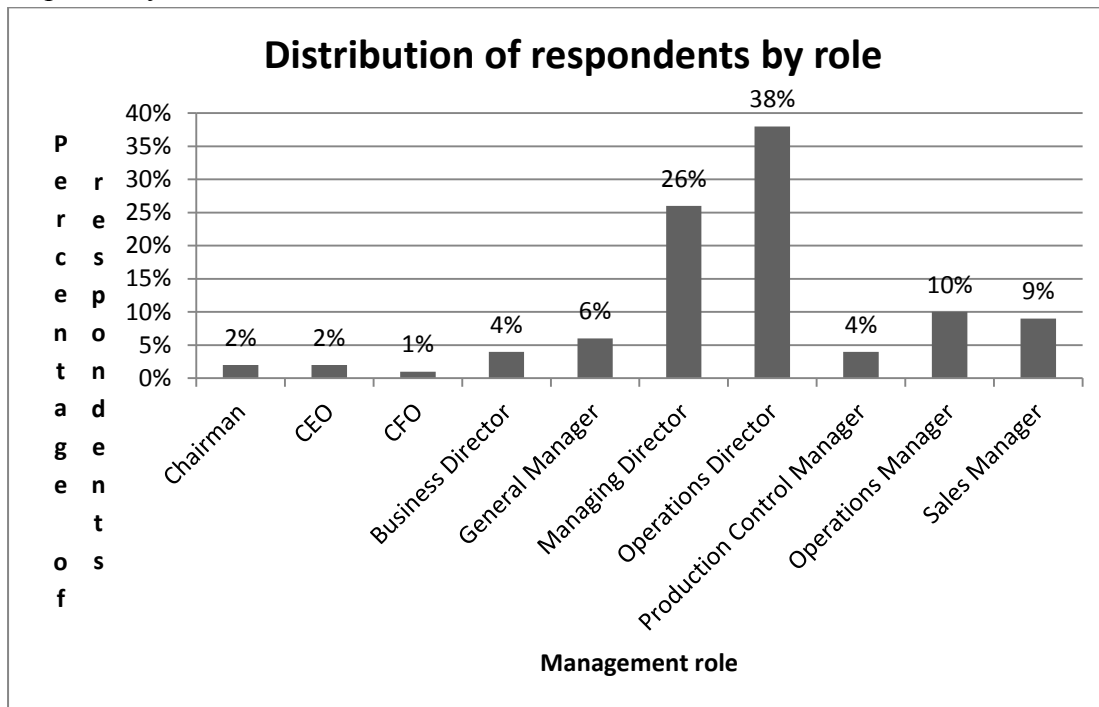
- The remaining 54% cover various industry sectors with participation between 7% and 1% for each represented, as shown in Figure 4.

The participants manufacturing SMEs are located throughout the UK, the majority being in England with 89% of manufacturing SMEs located there, 6% from Scotland, 3% from N. Ireland and 1% from Wales.



**Figure 4 - Industry sector (SIC code) distribution of survey participating manufacturing SMEs**

Figure 5 identifies Operations Directors and Managing Directors as the largest two respondent groups in the survey, comprising 38% and 26% of survey participants respectively.



**Figure 5 - Management role of survey respondents**

## 4.2. Interview sample

Following an invitation to all 104 survey participating manufacturing SMEs, 17 organisations agreed to take part in the follow-up interviews. The interview sample mirrors the survey sample by including representatives from each of the key demographic groups, as defined by company size, ownership and production type. Table 1 provides an indication of their profile.

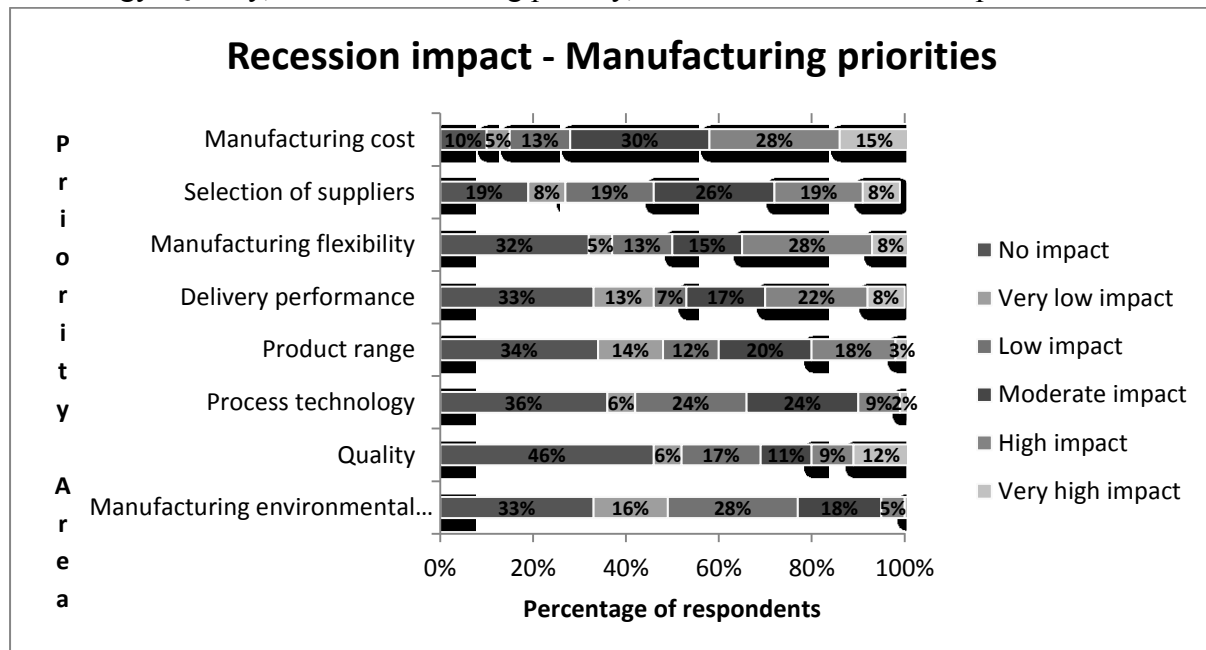
No	Company Size	Turnover (£ million)	Subsidiary	Age (years)	Production Type	Industry sector
1	201-250	6.6-26	yes	50	project, job, batch	Manufacture of machinery and equipment
2	101-200	6.6-26	yes	25	project	Manufacture of machinery and equipment
3	10-50	0.5-6.5	no	36	job	Manufacture of computer, electronic and optical products
4	51-100	6.6-26	yes	105	batch	Manufacture of chemicals and chemical products
5	51-100	0.5-6.5	no	38	batch	Manufacture of chemicals and chemical products
6	10-50	6.6-26	no	12	job	Manufacture of motor vehicles, trailers and semi-trailers
7	10-50	0.5-6.5	no	5	job	Manufacture of rubber and plastic products
8	10-50	6.6-26	no	89	job, batch	Manufacture of machinery and equipment
9	101-200	>26	yes	17	job, project	Manufacture of computer, electronic and optical products
10	51-100	6.6-26	yes	7	project	Manufacture of machinery and equipment
11	101-200	6.6-26	yes	30	job	Manufacture of fabricated metal products, except machinery and equipment
12	51-100	0.5-6.5	no	3	project, batch	Manufacture of basic pharmaceutical products and pharmaceutical preparations
13	101-200	6.6-26	no	53	job, batch	Manufacture of chemicals and chemical products
14	51-100	0.5-6.5	yes	165	project	Manufacture of computer, electronic and optical products
15	<10	0.5-6.5	no	30	project, job	Manufacture of machinery and equipment
16	101-200	6.6-26	yes	9	batch	Manufacture of basic pharmaceutical products and pharmaceutical preparations
17	201-200	>26	yes	50	batch	Manufacture of fabricated metal products, except machinery and equipment

**Table 1 - Interview sample demographics**

## 5. Study Findings

### 5.1. Manufacturing priorities

In terms of key manufacturing priorities for the manufacturing SMEs, manufacturing costs and supplier selection have experienced the greatest impact as a consequence of the 2008 economic recession, with relatively lower effects being recorded on other priorities including flexibility, environmental practices, delivery performance, product range and process technology. Quality, as a manufacturing priority, has witnessed the least impact.



**Figure 6 – Impact on manufacturing priorities by the 2008 economic recession**

The impact of the recession on **manufacturing costs** has been felt by 73% of the surveyed manufacturing SMEs, this being in the negative sense, with costs being increased. On one hand, with the Eurozone representing the key supply base for high-tech industries, an associated favourable exchange rate since January 2009 with the British Pound Sterling increasing its value against the Euro, has brought benefits to UK manufacturing SMEs. However, high levels of demand against low levels of stock available within the manufacturing SMEs' supply chain have put an upward pressure on raw material prices. In addition, manufacturing SMEs typically from the low-tech industries which are dependent upon commodities such as raw materials have witnessed cost increases for their supplies in line with commodities' price inflation. The major factors contributing to manufacturing cost increases as reported by the interviewed manufacturing SMEs managers are increases in material, energy, transportation and labour costs (to be discussed further in section 5.2).

For **supplier selection**, 80% of manufacturing SMEs suggest some impact, ranging from low to very high. The interviews revealed a relatively high level of relevance for supplier selection in terms of manufacturing priorities, covering issues such as recession impact in general, causes for manufacturing SMEs to invest in selection of suppliers, higher cooperation (partnerships) with suppliers, supplier location and types of raw materials.

The interviewees noted supply chain contraction comprising both sources of supply and reductions in available inventory. Supplier reduction can be explained to a great extent by various organisations entering administration during the recession. By forecasting shortfalls in demand, a number of suppliers have reduced production volumes. This defensive tactic, as a result of negative “*bullwhipping*” at the beginning of the recession, led to higher-tier suppliers having to manage high levels of stock and risk stock redundancy. These relatively low stock levels maintained by high-tier suppliers meant that when markets began to grow, impact was felt supply chain wide. The volatility in demand has affected supply prices with higher prices charged as another risk-reduction mechanism against this uncertainty. These pressures have affected the finances of manufacturing SMEs, particularly cash flow, whilst the general turbulence and pressures associated with supply chain management has seen its consideration within the manufacturing SMEs move to the strategic level. Given senior management involvement, manufacturing SMEs have reviewed and consequently started streamlining their supply chain to focus on long-term, sustainable and reliable *supplier-partnerships*.

Manufacturing SMEs have, where appropriate, moved towards greater vertical integration. This has been achieved by manufacturing in-house certain product components that were previously bought in, whilst other manufacturing SMEs have reluctantly turned to non-UK suppliers, a least preferable alternative for high-tech manufacturing SMEs, who correlate supply chain proximity with efficiency in their manufacturing process and high levels of finished-product quality. It is worth noting that supply chain proximity is typically seen as being sector specific.

The impact on priority relating to **manufacturing flexibility** is bimodal, with around a third of survey participants suggesting high to very high recession impact, with a similar proportion recognising no impact whatsoever.

Market pressures on certain manufacturing SMEs to provide more frequent and smaller batches delivered with shorter lead times, alongside greater product differentiation and customisation, have greatly impacted upon manufacturing flexibility. These changes, driven by differing customer expectations in a volatile business environment have had an arguably indirect influence on manufacturing flexibility. This has been addressed by many manufacturing SMEs investing in their manufacturing systems to account for the differing production profile presented above, which also brings with it, opportunities to become more agile in response to volatility and variability in customer demands.

Much the same response has been seen for **delivery performance**, with 33% of manufacturing SMEs indicating that the economic recession has had no impact, with 30% suggesting high to very high impact.

Whilst the recession may have had limited impact for a significant proportion of manufacturing SMEs, delivery performance still represents a key manufacturing priority. Where the affect has been more pronounced, lack of supply chain control is cited, which is problematic in the general sense given changes for the manufacturing SMEs sector where companies are losing orders due to delivery deadline failures, driven primarily by enhanced customer expectations, as described above. This is particularly challenging for manufacturing SMEs producing high-tech, bespoke products who are required to meet shorter lead times. Strategies initiated to counter these problems include redesigning of the manufacturing system, greater vertical integration, product price reduction as a means to gain competitive advantage, implementing concurrent engineering and pursuing greater cooperation with suppliers to guarantee raw material quality that meets pre-defined specifications. However, this is not unexpected, as companies look to become both leaner and more business sustainable, with the introduction of small orders and more frequent deliveries, which aim to reduce inventories, increase turnover and shorten “*cash to cash*” cycles.

A majority of the manufacturing SMEs saw no or only limited recession impact on their **product range**. However, the interviews provided evidence that some manufacturing SMEs have widened their product base in response to competition or international market opportunities. High-tech products and manufacturing process expertise has afforded a number of UK-based manufacturing SMEs with opportunities to provide consulting services to businesses located in various emerging economies. From this international perspective, competitors are catching up within the high-tech product arenas leading to domestic investment into product differentiation. Various participating manufacturing SMEs have adopted R&D strategies that underpin the provision of more complex product solutions.

In terms of **process technology**, 36% of manufacturing SMEs suggest that the recession had no impact with low to moderate impact accounting for 47% of surveyed organisations. This relatively low impact has been endorsed by the interviewees who confirmed comparable investment levels in process technology either side of the recession. These stable investment levels in process technology are seen as a supporting strategy in achieving greater product differentiation and delivery performance. Examples of particular investments include investment in automation, investment in knowledge and implementation of concurrent engineering and quality control.

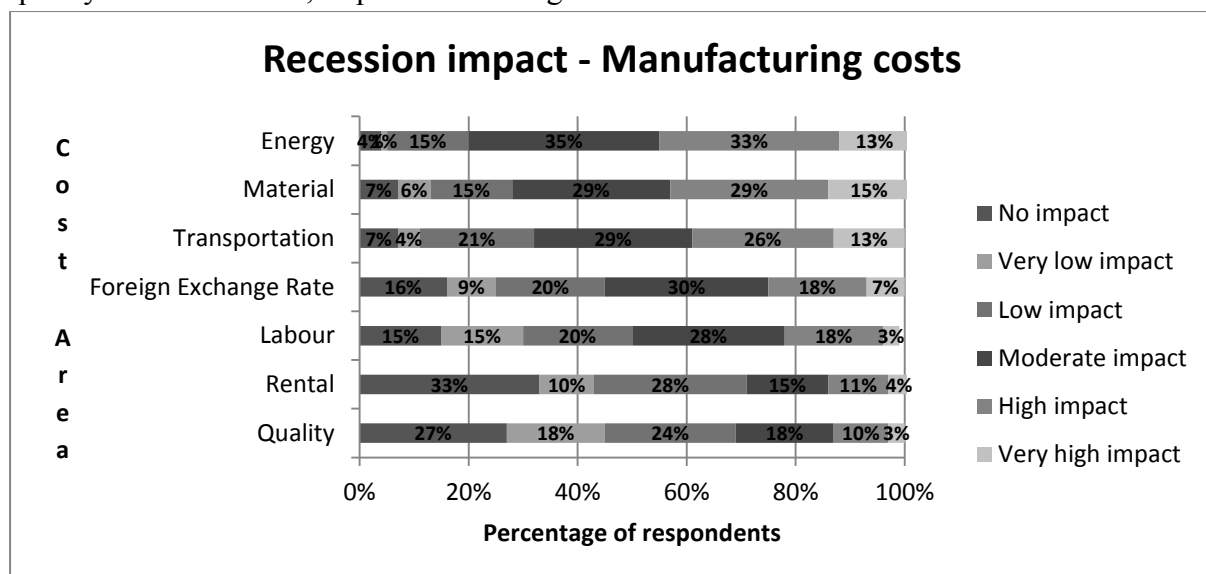
For **quality**, 46% of manufacturing SMEs indicate no recession impact whatsoever, although contradictory evidence is afforded by the study interviews which point to greater sophistication in the product range provided by UK-based manufacturing SMEs. This has led to challenges around maintaining quality, whilst a knock-on effect of diminishing supplier quality standards has impacted on the associated products. This has led the manufacturing SMEs to review their supply base to ensure that associated quality realises the highest possible levels.



Regarding **manufacturing environmental practices**, around one-in-three of the surveyed manufacturing SMEs have neither introduced nor increased related policies post-recession, with an additional 61% indicating low to moderate pressure to introduce such initiatives. Although manufacturing SMEs appreciate the increasing importance of environmentally related practices within their manufacturing operations, the interviews point to associated cost and risk barriers. Decisions relating to greener manufacturing investment are adopted mainly as a response to coercive customer pressures and to a lesser extend as a cost saving measure. Examples of adopted manufacturing environmental practices include automated lighting, electricity generating solar panels, implementing alternative manufacturing energy sources and embedding recycling policies for manufacturing waste by-products, the latter helping to create additional revenue streams and offset or reduce other costs such as waste management/disposal.

## 5.2. Manufacturing costs

The manufacturing SMEs survey data points to energy, material and transportation costs as being impacted upon the most by the 2008 recession, with the converse being true for cost of quality and rental costs, as presented in Figure 7.



**Figure 7 – Impact on manufacturing costs by the 2008 economic recession**

A high proportion, 96.1% of manufacturing SMEs point to some level of impact on **energy costs**, with the interviews giving an indication for causes and counter strategies being adopted. Particular sources cited include both electricity and gas, key consumers being the manufacturing SMEs' manufacturing operation, with space heating and lighting also affected. There is greater manufacturing SMEs awareness post-recession on the impact energy costs have on organisational finances, with the subject very much part of the consciousness and debate within senior management circles. Consequently, the manufacturing SMEs have considered various options to reduce energy consumption and therefore associated costs, including investing in energy efficient manufacturing processes, in greener energy generation systems and by renegotiating contracts with suppliers.

A clear majority of manufacturing SMEs have been impacted in some way by the recession with changes to **material costs**, with 29% of the survey respondents in particular feeling high impact and a further 15% very high impact. Typically, material costs represent, as reported here, a large proportion of the total operating costs for the manufacturing SMEs. A common reason for greater impact is the reduction in stock levels held by suppliers resulting in upward pressure on raw material prices. This has had a knock-on effect with manufacturing SMEs increasing product prices in response to the higher cost base. Various strategies have been followed in response to material cost increases, such as cost reduction in other parts of the manufacturing process, renegotiation of supply contracts and greater application of formal forecasting techniques. What has been witnessed here is a common implicitness towards adoption of lean paradigms, rather than stated explicitness.

Likewise, a majority of manufacturing SMEs have been impacted by the recession on their **transportation costs**. Increases in fuel costs and vehicle insurance for movement of goods or sales personnel within the UK are cited by various interviewees. Movement towards smaller and more frequent customer orders in line with changes in customer expectations has driven up transportation costs. The manufacturing SMEs supply chain in its entirety has become more expensive as suppliers have transferred their increased transportation costs onto their customers. In response to this, manufacturing SMEs have deployed various strategies aimed at shrinking transportation costs including using alternative modes of goods shipment where possible, exploiting additional further local and/or national markets for new customers and reducing the number of logistics contractors. This allows for greater economies of scale by increasing shipping volumes across a smaller third party logistics provider base.

Consideration of **foreign exchange rates**, specifically the British Pound Sterling against other major currencies such as the Euro and US Dollar suggests a split response with a quarter of manufacturing SMEs suggesting little or no impact with a similar proportion suggesting a very high impact during this period of their business activity. About one-in-six of the manufacturing SMEs suggested there was no impact whatsoever. Both positive and negative effects were recognised in the interviews, alongside various strategies implemented to counter unfavourable circumstances.

For manufacturing SMEs exporting to the Eurozone, value increases for the British Pound Sterling made products less price-competitive, although those relying on suppliers located here experienced some levels of cost advantage. For manufacturing SMEs exporting more globally, there were positive experiences during this time period, whilst more generally, manufacturing SMEs trading outside of the UK noted the impact of foreign exchange rate fluctuation on competitiveness and profitability. Strategies adopted to provide some kind of protection included application of forecasting and hedging techniques to predict the value of the British Pound Sterling against their markets and supply-base and negotiation of trade contracts in British Pound Sterling using fixed rates.

The impact on **labour costs** are much the same as that described for foreign exchange rates. A number of interviewees from the manufacturing SMEs indicate higher labour costs, perhaps surprisingly, given the reporting of higher levels of labour available to UK manufacturing. To understand these conflicting findings, it is worth considering specific labour types across the sector. Where manufacturing SMEs operate high-tech manufacturing processes, it is necessary to have highly-skilled labour which is in short supply, and as such, can demand premium financial rewards. In contrast, manufacturing SMEs employing low-skilled shop floor personnel report high labour turnover which has increased training budgets. A number of manufacturing SMEs have increased their in-house manufacturing, thus requiring additional labour leading to increased costs in terms of salaries and employee development. Examples of strategies deployed to counter these cost increases comprise investment in automation, maintaining salary increases for existing staff at low levels, employing university graduates and using location as a source of competitive advantage by suppressing labour costs. Further, recent evidence has emerged indicating an increase in apprentice uptake as the UK economy has moved out of the recession despite the relatively long “*pay-back*” linked with this type of training.

One in three of the manufacturing SMEs have indicated that the recession has had no impact on **rental costs**. A large number of manufacturing SMEs own their premises making the issue of rental cost irrelevant, whilst those who do rent have reported that they expect costs to stay low or have been able to negotiate lower price given the surplus of available buildings. These findings stand counter to the wider body of research literature reviewed, perhaps suggesting that property portfolios play an important part of longer term asset management and pension provisions.

In the context of this study, **cost of quality** refers to rework costs incurred as part of the production process. The survey responses provide mixed messages, 27% of manufacturing SMEs report no impact with a slightly greater proportion suggesting moderate to high impact.

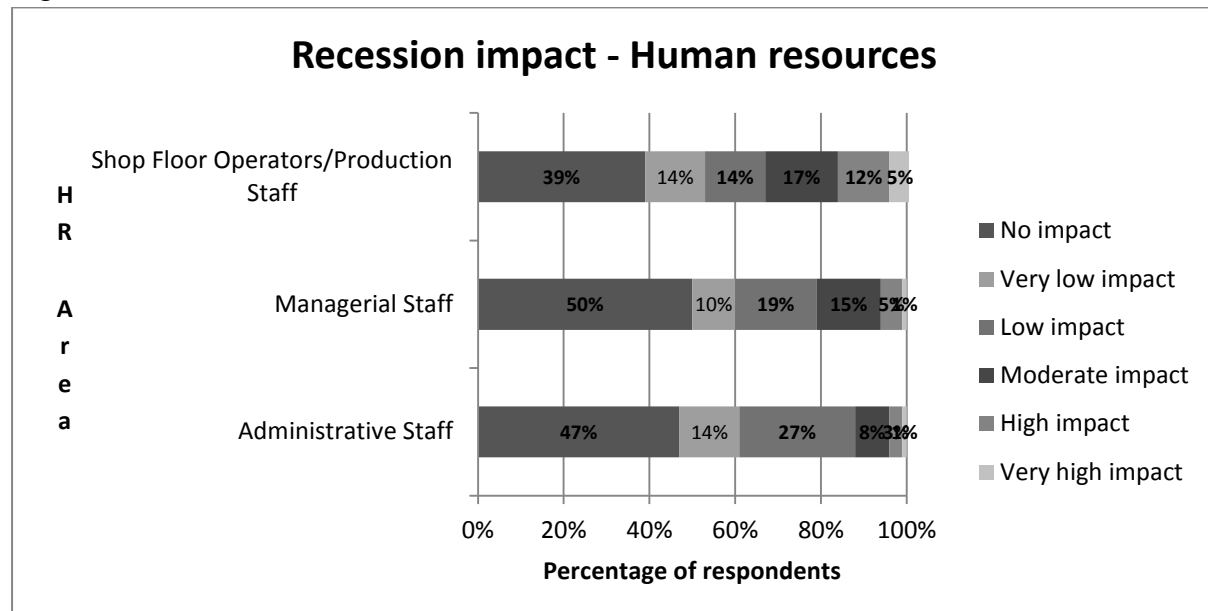
All of the interviewed manufacturing SMEs defined themselves as being high investors in quality. Where quality issues have emerged, key drivers were identified as shorter delivery deadlines expected by customers and quality issues emerging within their supplier base. To respond to increases in quality-related costs, manufacturing SMEs are moving towards enhancing employee involvement through the introduction of communication channels to reinforce the importance of the quality agenda as an integral part of the associated manufacturing process and making employees aware of the associated performance indicators, whilst striving to achieve an organisational culture of embeddedness.

Further comments relating to cost increases saw certain manufacturing SMEs highlight the strength of the Euro and Yen against the British Pound Sterling making imported supplies more expensive. SMEs financing, particularly around lack of investment by corporate lenders and Government was also cited, whilst one manufacturing SMEs commented on

Local Authority and employment taxes exhibiting the greatest proportionate increase compared with other operational costs.

### 5.3. Human resources

The period of recession has led to differing levels of impact according to role, as indicated by Figure 8.



**Figure 8 – Impact on HR aspects by the 2008 economic recession**

The manufacturing SMEs have indicated that the economic recession has had a relatively large impact upon the recruitment and retention of appropriately skilled shop floor operators/production staff, whose availability has for a number of manufacturing SMEs diminished. Key issues emerging from this study are recognition of a shortage of skilled shop floor operators/production staff, and the role of apprenticeships.

Like the emerging picture for managerial staff to be presented below, the study highlighted similar factors for **shop floor employees** from its interviews. Issues highlighted consisted of industry-specific skills shortages, inability to attract machining specialists and recruitment of employees who can work with flexible manufacturing systems. Throughout and post-2008 economic recession, many manufacturing SMEs have experienced a cyclical market demand pattern which presented challenges in the procurement at short notice of employees on temporary contracts, with the patterns of employee demand making manufacturing employment appear less attractive to potential recruits. There were contradictory messages here with certain interviewees highlighting the decline in numbers of young potential employees having an interest in manufacturing opportunities alongside shortages in specialised development personnel. In contrast, other manufacturing SMEs pointed to a wider pool of recruitment candidates available, with good quality individuals targeting their vacancies. There are, however, location-specific advantages to recruitment in this arena, particularly in the North of England where relative scarcity of employment exists and the

rewards attached to these positions makes them attractive to the marketplace.

Given the challenges presented by a declining skills base, a common theme in the study was the potential role of apprenticeships in helping to address the ageing staff profile and the limited availability of trained young engineers. This led to a call for greater Government support and funding for apprenticeships. Nevertheless, once again, comment can be made about the apparent dichotomy between skill shortage and a lack of Government willingness to invest in longer term training.

The economic recession has had some impact on the availability of suitable **managerial employees** with three key areas being highlighted as underlying factors; lack of skills in available employees, university graduate recruitment and the position of UK manufacturing. Where the study participants have reported no problems or issues in the procurement of managerial employees, there has been recognition of their relative good fortune in recruiting suitable candidates from other UK manufacturers who have entered administration resulting in a pool of experienced managers seeking employment. This suggests that a longer term view around development and training of internal resources may enhance organisational stability and sustainability.

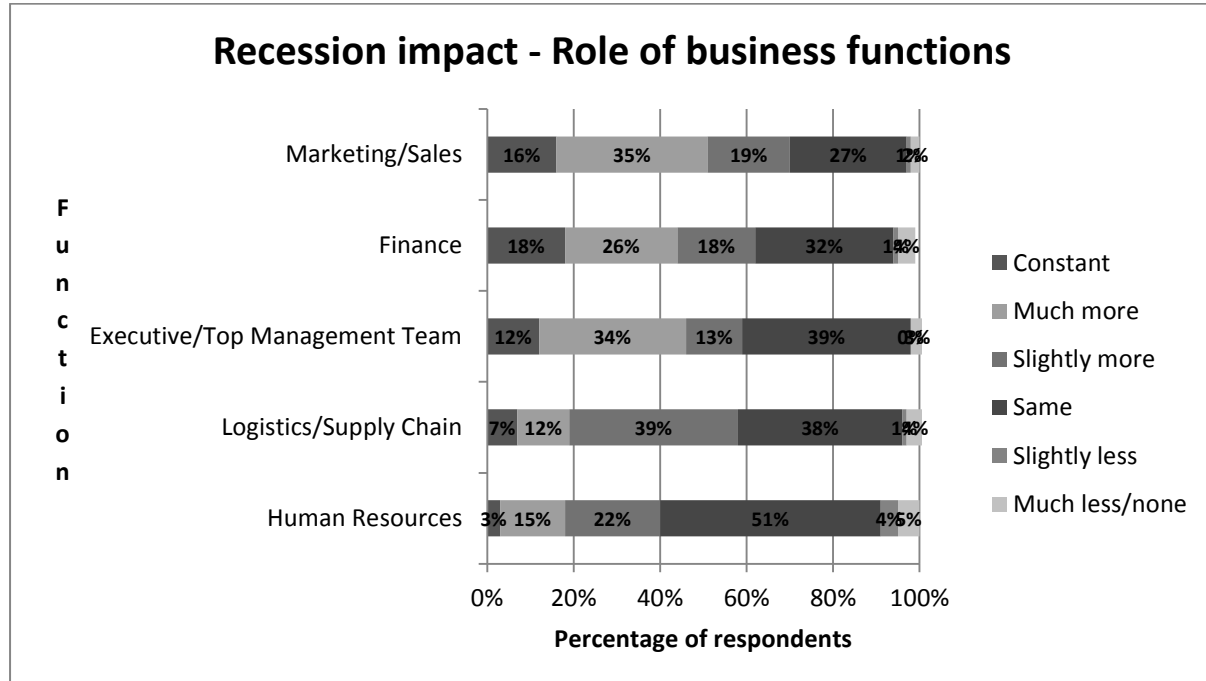
For those experiencing difficulty in recruitment comment has been made on the lack of suitable skills in middle and senior managers seeking employment, where greater value is placed on industry-specific rather than generic managerial skills. The ageing profile of suitable managerial candidates is recognised as being problematic with organisational size being viewed as a barrier for not attracting quality managerial candidates. Manufacturing SMEs turning to University graduate recruitment have experienced various challenges including a lack of engineering graduates, inappropriate attitudes and expectations, organisational size proving prohibitive in this arena also. Manufacturing decline and the image the sector provides to potential younger employees is viewed by the manufacturing SMEs as contributing to the relative lack of experienced managers or engineering graduates. Notwithstanding this, it suggests “*workplace*” degree programmes may offer tangible benefits to organisations.

In relative terms, the recession has had only a moderate impact on the availability of **administrative staff**, supported here by the survey responses and the interviews where the participants did not consider such recruitment to be an area of concern or priority.

#### **5.4. Role of the business functions**

Consideration has been given to the role of non-manufacturing business functions in the manufacturing strategy formulation post-2008 economic recession. The marketing/sales function represents the largest contributor to the manufacturing debate within the surveyed manufacturing SMEs, followed by executive managers and the finance function. In contrast, Human Resource managers have exhibited the smallest change in involvement levels

compared with pre-recession times, as indicated by Figure 9. An interesting outcome of this assessment was that “*manufacturing strategy*” as a concept was considered synonymous with “*business strategy*”, perhaps suggesting that manufacturing SMEs do not necessarily distinguish between corporate level strategy and functional level manufacturing strategy.



**Figure 9 – Role of business functions post-recession on informing manufacturing strategy**

A higher involvement post-recession by the **marketing/sales** managers is indicated by 54% of manufacturing SMEs, with 27% suggesting similar levels of involvement. Three issues emerged from the interviews; level of marketing involvement, causes for higher marketing involvement and marketing contribution. The level of involvement was evidenced by a stronger and more explicit involvement in determining manufacturing strategy, whilst this steer towards marketing was viewed as an enabler of competitive advantage during the recession period, the latter affording some change in direction for those manufacturing SMEs seeing themselves as previously operating in a relative comfort zone. A risk attached to the pre-recession position was that many manufacturing SMEs were reliant upon senior managements’ personal networks that were arguably not sustainable into the long-term. Consequently, the interviewed manufacturing SMEs recognised the necessity for greater involvement for, and investment in, marketing as a growth enabler. Moreover, manufacturing SMEs are investing in various marketing tools that permit contact and communication with potential business-to-business (B2B) customers. The more recent and prominent marketing involvement within manufacturing strategy formulation process is considered to be market and customer led.

Various initiatives put in place by the manufacturing SMEs to support their marketing provision were identified, with changes to both organisational action and mind-set. These



included building dedicated marketing teams and including the marketing manager within the senior management group, creating focused promotional strategies incorporating events such as trade fairs, embarking upon diversification through the identification of product application in new markets and using consultants or other external bodies for enhancing the skills base of current marketing staff. The manufacturing SMEs have been active in building internal communications paths between the marketing, product design and manufacturing functions and externally by promoting success stories of product applications through trade publications and investing in customer relationship management, evidenced by frequent visits to the existing customer base. They have started to view their customers as a receiver of a service centred on product solutions rather than another component of their organisation's supply chain.

Similar to the marketing/sales function, the **finance** function is viewed by a significant proportion of manufacturing SMEs, 45%, as having a greater involvement in manufacturing strategy development post-recession. Finance is considered at least at an equal level to other business functions and its enhanced role in formulation of manufacturing strategy is seen as being linked to the recession where various manufacturing SMEs forecasted the downturn and subsequently limited investment in their manufacturing systems. The reduction of profit margins and shrinkage of sources of external funding has enhanced the role of the finance team, who also have a key role in supporting the manufacturing SMEs in responding to a reluctance by the banking sector to continue investment and support, the role of hostile private investors, as well as customer behaviour and market volatility by means of negotiating skills and the exercise of greater financial controls.

These manufacturing SMEs have implemented various strategic actions in response to diminution of their sources of finance and the role of volatile markets including tighter operating cost control, building closer links and channels of communication between finance and manufacturing functions highlighted through the implementation of formal and detailed reporting systems and enhancing their research skills so as to provide more financial forecasting.

A similar proportion of manufacturing SMEs reported some increase in **senior management** involvement in manufacturing strategy formulation post-2008, in particular the higher level of involvement of seniority in the financial function. Key areas of interest for the senior team have centred in this time period on addressing rising energy costs, and by doing so, exploring opportunities to invest in greener energy sources, particularly those which attract subsidies. The senior management teams have also witnessed increases in their activities relating to customer networking in order to put in place long-term business relationships.

The relative change in contribution of managers from the **logistics/supply chain** in the development of manufacturing strategy was less pronounced than the business functions considered already, with around three quarters of the manufacturing SMEs reporting either no



change or slightly more involvement in these activities, although recognition is given by certain manufacturing SMEs that this function should play a greater part in these developments. This is particularly important when the “*unionist*” view of logistics prevalent in larger organisations and the benefits it brings are considered. In addition to this, since the survey respondents in the study identified innovation, service adding and new product development as key to their future success and sustainability, these organisations will benefit significantly by developing cross functionality at their marketing and logistics interface.

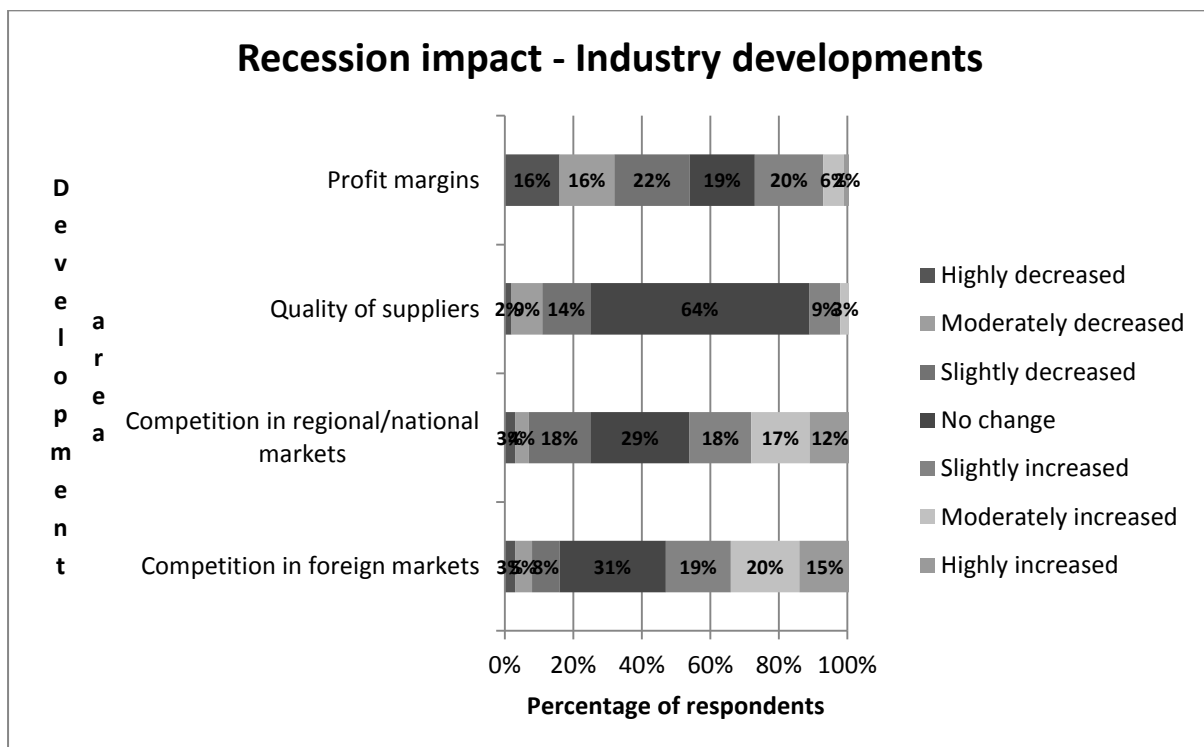
Reduction in the quality of products supplied, changes in customer demand relating to smaller and more frequent batch deliveries and shrinkage in the supplier base are areas of focus in strategy formulation for this functional area, leading to an increase in focus on the identification of sustainable suppliers with whom to build relationships, identification of cost efficient shipment methods for both supplies and finished products and the evaluation of the manufacturing SMEs’ existing procurement and purchasing requirements.

In relative terms, the role of the **HRM function** has changed the least post-2008 in terms of contribution towards manufacturing strategy formulation, with a small majority maintaining comparable levels of engagement. For those playing a greater role, there have been increases in employee levels post-2011 driven by increased orders being received and therefore a necessity to identify appropriate employee training given existing skills levels amongst new recruits. It has also been necessary for some HR managers during the recession to implement redundancies and increases in salary bargaining between employers and workforce during a period of zero or low increases in remuneration has provided further challenges.

In addition to the changing role of the key business functions presented above with respect to manufacturing strategy formulation, **research and development’s (R&D)** role was considered by various interviewees as being enhanced in these activities as a result of the 2008 recession. Central to this strategy formulation was its contribution in key areas such as enhancing customer satisfaction, reduction in manufacturing lead-times and the realisation of concurrent engineering.

## **5.5. Industry developments for manufacturing SMEs**

The change in impact of various industry developments is presented in Figure 10.



**Figure 10 – Impact on areas of industry development by the 2008 economic recession**

The nature of response relating to profit margins is based on an individual manufacturing SMEs perspective rather than one which is sector or industry specific. Two areas for consideration emerged, **profit margin** levels, causes for profit margin fluctuation and manufacturing SMEs strategies to deal with this fluctuation.

The majority reported a decrease in profit margins during economic recession, although many of those participating in the study did stay profitable in this time period. Diminution of profit margins was driven by reduction in orders and aggressive industry-wide pricing. Since early 2011, various manufacturing SMEs reported on sudden increases in market demand despite continued evidence of volatility. Currency volatility on international markets has had both a positive and negative impact in this time period on profit margins, specific to the individual manufacturing SMEs and their trading profiles.

Areas that have specifically driven down profits include increased, more frequent transportation phases and energy costs, price volatility in raw materials that have contributed here and to uncertainty, whilst supply-chain centred quality issues are reported as a negative contributor to profit margins. Strategies reported to cope with volatility or reduction in profit margins have typically centred on a closer focus on finances and cash flow reserves.

For **quality of suppliers**, three issues emerge, recession impact on supplier quality, reasons for change in supplier quality and manufacturing SMEs strategies to respond to these changes. Contradictory evidence has been presented in this study, where almost two thirds of the survey participants reported no changes in supplier quality, whilst the interviews point to

a variety of factors that have impacted negatively on quality, these being reduction in the numbers of UK-based suppliers, inferior raw materials or product components and reduction in the size of supply volumes. Each of these factors occurred due to the economic recession resulting in a contraction of UK manufacturing as well as associated stock levels. Manufacturing SMEs' strategies to deal with supplier quality include review of the existing supply chains and transformation of internal operations towards vertically integrated manufacturing, although these overlook better supply relationship management (SRM) strategies and more “*vested*” outsourcing opportunities; indeed a small number of interviewed manufacturing SMEs referred to “*investing into partnerships with suppliers*” as a part of their post-recession business strategy.

From the survey, 29% of manufacturing SMEs indicated the same **levels of competition**, with 46% experiencing higher levels of competition within regional/national markets and 24% of the surveyed manufacturing SMEs indicating a decline in competition since the 2008 recession. From the interviews, manufacturing SMEs suggest mature UK markets encompassing a range of industries and including a significant number of manufacturing SMEs now specialising in niche sectors. There has been a perception that growth in competition has been relatively static. The more successful in the sector have chosen a differentiation strategy, although the 2008 economic recession has resulted in a number of UK-based manufacturing SMEs entering administration. The changing direction of the competition has delivered many new entrants, who are typically sole traders having faced redundancy during the recession and are consequently pursuing entrepreneurial ventures as a way of re-entering the employment market. Such participants have joined at the lower end of their respective markets and are more likely to be operating under cost leadership strategies.

Various strategies have been put in place to respond to local and national competition. These comprise reduction of prices which has also led to a decline in profit margins, investment in marketing and customer relationship management, reduction in manufacturing lead-times in order to enhance customer delivery schedules, identification of acquisition opportunities relating to other of UK manufacturers, particularly involving those who have entered administration and reduction of manufacturing costs by means of introducing various initiatives including concurrent engineering, waste reduction strategies and energy efficient manufacturing practices.

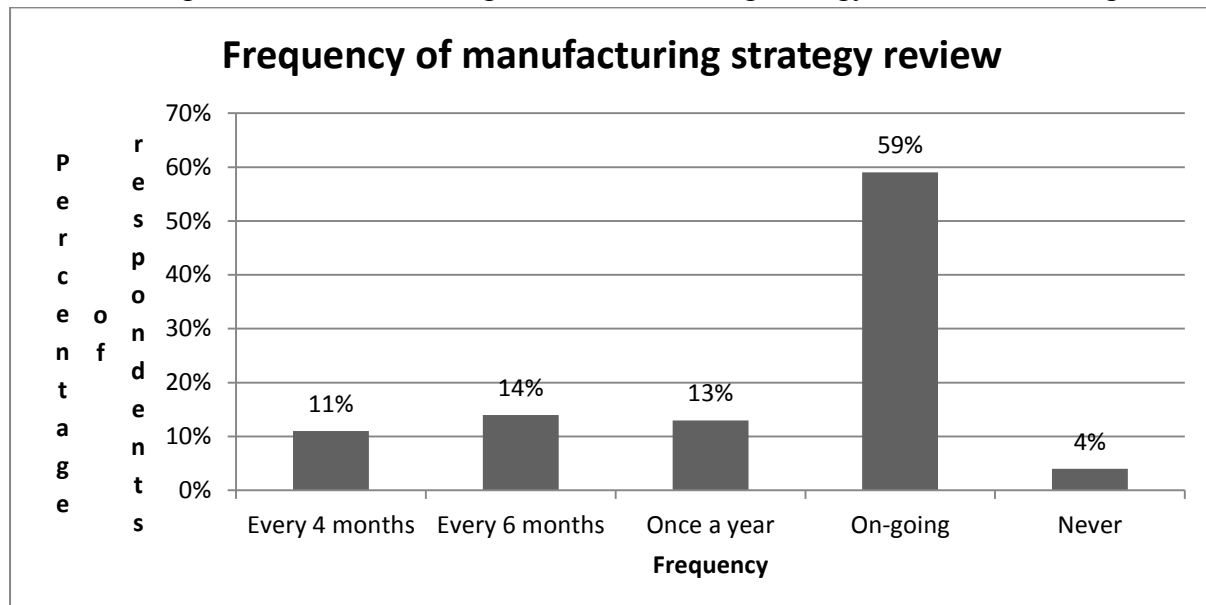
A varied, and at times, contradictory picture emerges regarding **competition from foreign markets**. The majority, 53% of surveyed manufacturing SMEs, reported increases in competition within their foreign markets, although the consensus amongst the interviewees points to lower levels of competition in this arena. There are industry-specific experiences, with manufacturing SMEs operating within high-tech industries reporting similar to weaker competition, particularly within their European markets, whilst those positioned in the low-tech industry sectors are facing increased competition, particularly from the world's emerging economies. Most of the interviewees suggest that the foreign markets represent their primary

business, witnessing opportunities within Europe and other developed markets such as North America, Australia and New Zealand, driven by demand for high-tech and customised products. There are also increased opportunities for consultancy services for experts from the manufacturing SMEs, with demand particularly from the emerging markets of China and South America.

In short, niche applications and differentiated products that are supplied in low volumes represent the key areas of success for UK-based manufacturing SMEs, with this picture being applicable to both regional/national and foreign markets.

### 5.6. Frequency of manufacturing strategy review

The majority, 59% of the surveyed manufacturing SMEs, take an on-going approach to manufacturing strategy review. Almost all of the rest take a periodic approach, with roughly equal numbers undertaking this once, twice or three times a year, with only 4% of manufacturing SMEs never reviewing their manufacturing strategy, as indicated in Figure 11.



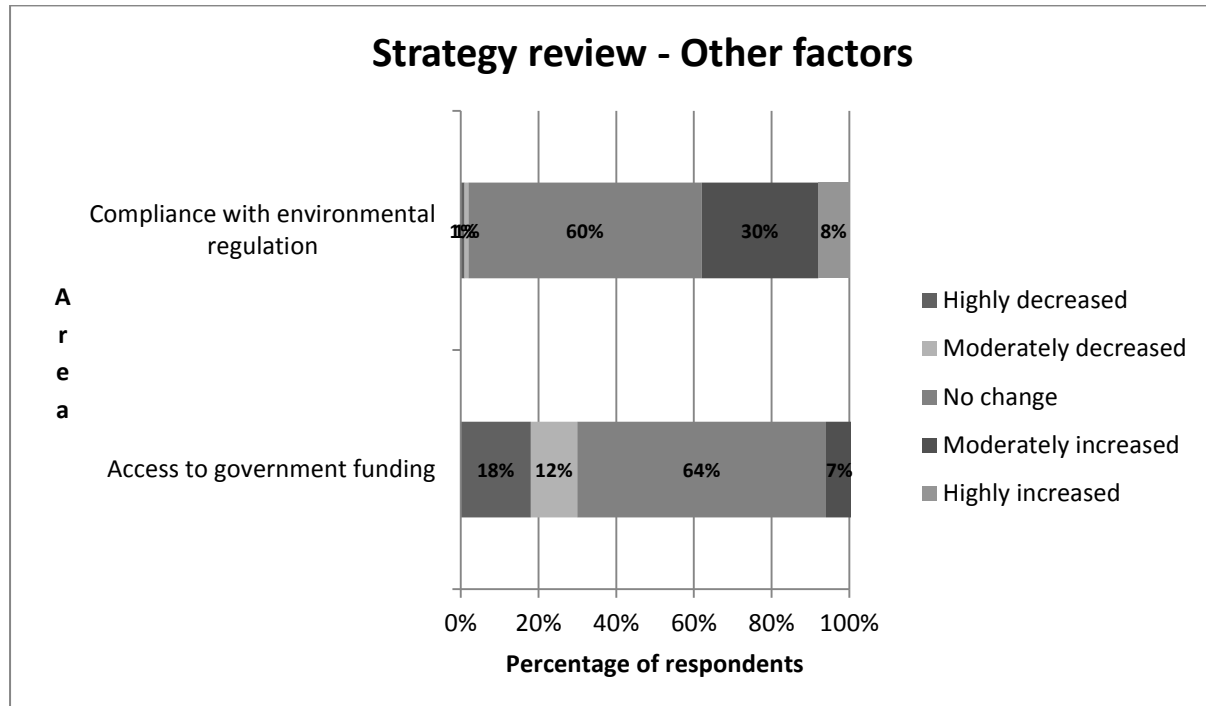
**Figure 11 – Manufacturing strategy review post-2008 economic recession**

Three key issues emerged from the interviews, timing, the level of formality or informality relating to the review process and its implementation. Strategy formulation points to mixed practices. For some, recession led to changes in timing and importance. Typically, the formal component of the process was undertaken annually, with relatively informal and undocumented manufacturing strategy process occurring on an ad-hoc and on-going basis, notwithstanding the recognisable evidence from this study that a formal manufacturing strategy formulation process does exist within a number of manufacturing SMEs. There is perhaps some cynicism as to the effectiveness of the actual planning process, given the necessity for the managers involved and the size of the organisations to keep the related discussions both fluid and flexible.

For implementation, the participating manufacturing SMEs seek to embed their manufacturing strategy through deployment of formal communication methods and have expectations of accountability for all employees associated in the implementation process.

### 5.7. Impact of Government policies on manufacturing SMEs

The differing profile for two aspects of government policy is presented in Figure 12.



**Figure 12 – Impact of areas of Government policy post-2008 economic recession**

Two key issues have emerged with regard to **compliance with environmental regulations**, manufacturing SMEs feeling direct pressure from environmental regulations and manufacturing SMEs' developing strategies to achieve energy efficiency. The manufacturing SMEs reported no change in new regulations levels driven either by central UK government or the European Commission. Most examples relate to operational regulations such as transportation of goods or product licencing rather than regulations requiring emissions or waste reduction. In terms of actions taken around these reductions, these include investment in automated lighting systems, electricity generating solar panels, searching for alternative manufacturing energy sources, policy formulation relating to recycling manufacturing waste into by-products and the deployment of hybrid fleet vehicles. It remains to be seen how manufacturing SMEs are likely to respond to/manage emerging issues such as water management and carbon reporting, but it is likely that the more universal ISO series of compliance schemes will be preferred to the Eco-Management and Audit Scheme (EMAS).

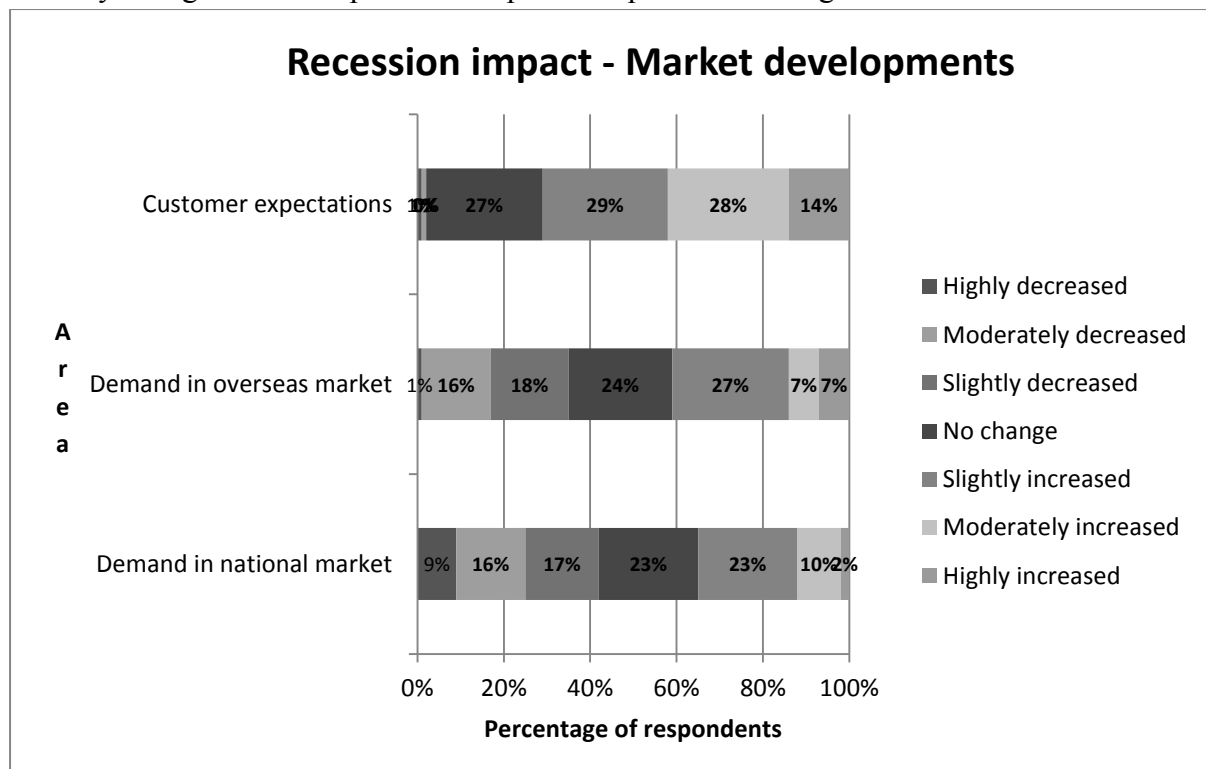
Three key issues emerged from the consideration of **access to government funding**, level of funding and support available, categories of government funding and support accessible to manufacturing SMEs and reasons why government funding and support are either inaccessible or unattractive to manufacturing SMEs. Where 64% of the surveyed

manufacturing SMEs indicate no changes in government funding and support, they further suggested low levels of support both pre- and post-recession and a general level of disappointment in the funding and support offered by the UK government.

For those utilising government pre-recession, typical reference was made to the now defunct Regional Development Agencies (RDAs), seen by many in this study as an excellent source of support. Financial support indicated included R&D tax credits, funding towards marketing and travel expenditures for attending overseas trade exhibitions, the Carbon Trust, funding towards manufacturing investments that underpin job creation and funding for training. Various participants have utilised market research reports available from Government sources, which were comprehensively endorsed. However, most participating in the interviews were disappointed by high levels of bureaucracy and lengthy applications processes relating to government funding applications. Areas of potential for development included the funding for apprenticeships and supporting business working capital.

## 5.8. Market developments

The key changes for three particular aspects are presented in Figure 13.



**Figure 13 – Impact on areas of market development by the 2008 economic recession**

The greatest changes emanating from the 2008 recession relate to changes in **customer expectations**, in particular the customers of the manufacturing SMEs appear much more demanding in three key areas. The first relates to delivery performance, encompassing more frequent orders involving smaller batches, as indicated earlier in this report. Related to delivery performance are the inclusion of financial penalties for late deliveries and aggressive

supply chain management deployed by increasingly powerful customers. The second change is shorter product life cycles driven by frequent customer requests for higher product specification and features with associated suppressing of increases to price in accordance with additional costs of product development and complexity. There has been particular shortening of the product design stage within this product customisation. There is movement towards customer relationships being driven by “*solution offerings*” rather than “*manufacturing excellence*”, the latter being assumed as a given, with manufacturing SMEs’ customers increasingly needing to invest in innovative partners and/or suppliers.

**Demand in the overseas markets** showed greater increases than its domestic equivalent. The demand locations are typically the developed economies of Europe, North America, Australia and New Zealand. These are now accompanied by certain emerging economies, such as those from South America. Some manufacturing SMEs indicated up to a twofold increase in export activity since the start of the economic recession. To meet market expectations, manufacturing SMEs are developing dedicated export driven growth strategies by investing in product development, building solid distribution networks, spending on relevant promotional activities and investing in manufacturing local to the specific markets. It could also be recommended that a greater degree of digital interconnectivity within supply chain management represents best practice for the sector.

For **demands in the national market**, various changes have taken place, in particular market volatility with cycles of typically one to two calendar quarters, decreases in numbers driven by insolvency or industry consolidation, weaker markets and changes in type of demand. Market volatility has caused challenges for manufacturing SMEs in forecasting production demand and making strategic investment decisions. Manufacturing SMEs monitor more closely finances, especially cash flow. Maintenance of existing customers and capturing of new clients is supported through investment in flexible and efficient manufacturing systems to meet the increased frequency of new orders and associated smaller batch sizes.

## 6. Conclusions

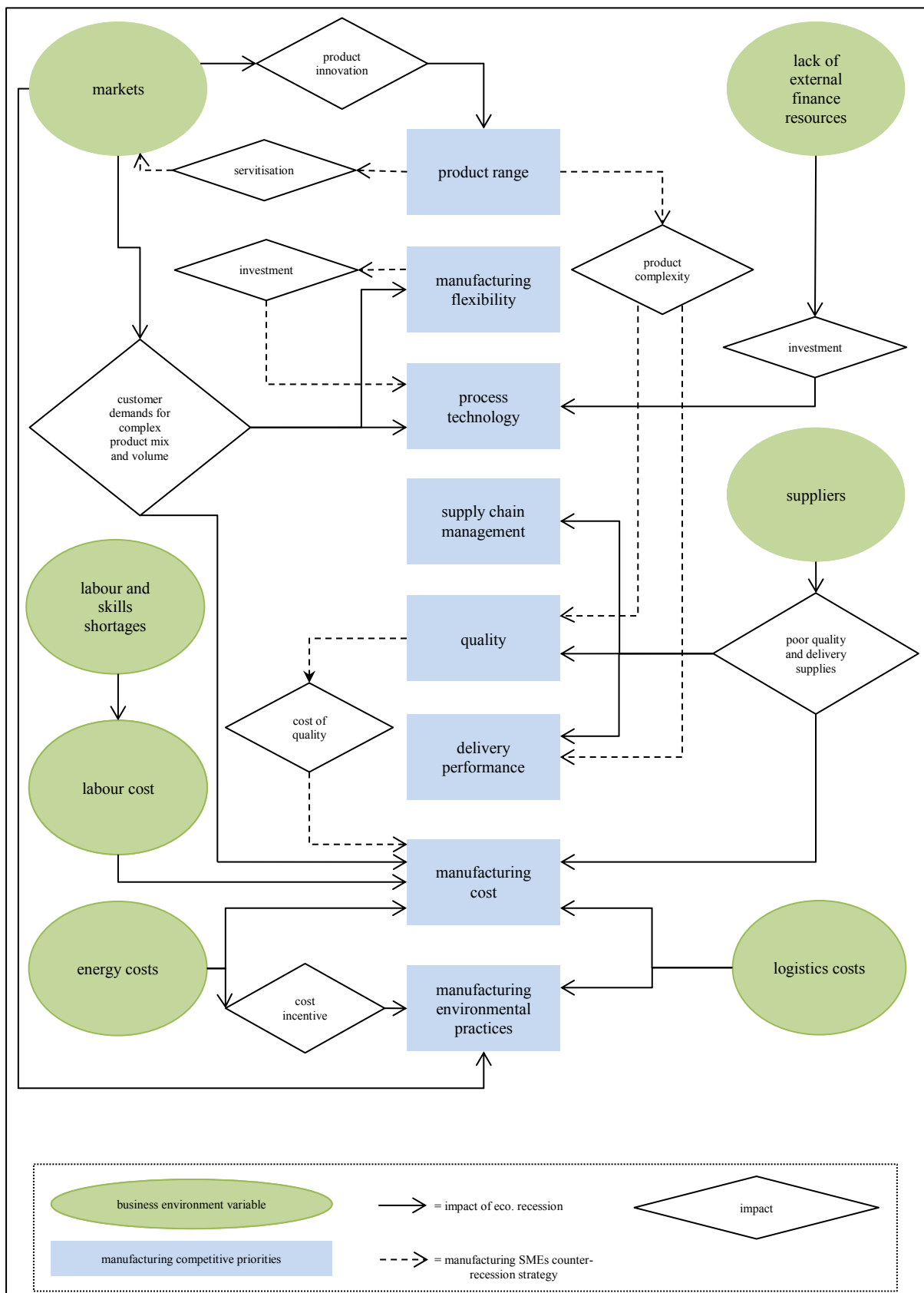
The present report offers an insight to manufacturing SMEs’ managers on how their sector has experienced and strategically positioned itself against the uncertainty and volatility of the business environment as developed by the post-2008 economic downturn. Manufacturing SMEs need to consider the strategic implications of their market demand for shorter and more frequent orders which puts pressure on their manufacturing competitive priorities of cost, flexibility and delivery performance. In addition, the study manifests the growth of servitisation as a source of additional income for manufacturing SMEs, for which manufacturing SMEs’ managers will need to consider their degree of differentiation against an already competitive, but growing overseas market, currently served by large-size manufacturing and consultancy multinationals.



Figure 14 schematically captures the findings presented in this report as discussed in the earlier sections. The figure identifies the business environment variables which have a direct impact on manufacturing SMEs' competitive priorities in the post-2008 economic recession business environment. In addition, it illustrates the counter-recession strategies available to UK-based manufacturing SMEs as evident by the data collected in this study. What is also significant in Figure 14 are the links between manufacturing competitive priorities which are expected to shape future manufacturing strategies of manufacturing SMEs, ultimately promoting a sustainable business model.

Moreover, the study provides strong evidence of manufacturing SMEs calling for further investment by the UK government in vocational training and a strong promotion of engineering career paths for young people. The findings suggest three types of investment: (i) apprenticeships at manufacturing employers and (ii) vocational training. In addition, the abolition of Regional Development Agencies (RDAs) in April 2012, has led to a vacuum in good quality SMEs' support and consultancy. Although some of these duties have since moved to local Business Links and manufacturing Advisory Services (MAS), a number of manufacturing SMEs managers who took part in this study expressed their disappointment at the new SMEs support mechanisms. Indeed, there is an argument that where more than one Local Enterprise Partnership (LEP) has emerged from the ashes of an RDA, direct competition devalues and dilutes available funding to SMEs.

The continuous support for manufacturing innovation is now of strategic importance, both at Government and business level. The launch of the Business Growth Fund (BGF) in May 2011 came as a response to the lack of private finance available to SMEs, which although complex in its design, has so far proved a relative satisfactory source for alternative manufacturing SMEs funding.



**Figure 14 – Post-recession manufacturing competitive priorities**

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