Manufacturing the Future?

Advanced manufacturing in Greater Manchester

1 SUMMARY & RECOMMENDATIONS

1.1 The British economy urgently needs to grow its economy and create more private sector jobs. In the wake of the most severe recession in a generation – with continued slow growth, high inflation and weak consumer demand – British industry needs to become more competitive globally, to take advantage of growth and trading opportunities in other parts of the world.

1.2 In this light, the Government has a clear stated desire to promote the development of export-driven industries and growth regions outside London and the South East, to create a more sustainable model for UK growth in the future. A key part of the Government's 'Growth Framework' is advanced manufacturing – a sector that is increasingly seen as a key driver of growth and innovation in the economy.

1.3 Whilst the manufacturing sector as a whole has continued to contract and lose employment and profitability in recent decades, elements of the sector have clearly thrived. These successful manufacturers are often globally competitive exporters, specialising in innovative and advanced forms of production and their supporting services – and often actually have much in common with service sector firms, with production tending to be capital-intensive and involving a high degree of office-based service-type activity.

1.4 Our research shows that Greater Manchester has a strong base of advanced manufacturing activity compared to other UK cities and to national averages. This conurbation has more manufacturers engaged in high-technology manufacturing (the highest-level sub-set of advanced manufacturing) than all other comparator cities outside London, and there are over 38,000 employees working for the whole of the advanced manufacturing sector – higher than all comparator cities except for Birmingham.

1.5 On another positive note, our advanced manufacturing firms in Greater Manchester are continuing to grow in terms of productivity, with strong growth in sales and profits evident. The increased competitiveness and profitability of these companies – a key indicator of higher productivity – is vital to the diversity and strength of the business base; as such companies will prove more resilient and have the potential to foster further innovation through supply-chains.

1.6 However, our research also finds that advanced manufacturing is not immune to the trend of declining employment, and employment in the sector has generally decreased both locally and nationally (albeit a slower rate than manufacturing as a whole), as productivity has increased. It is therefore very unlikely that advanced manufacturing will be the panacea to jobs creation that many hope it will be.

Whilst this decline is forecast to slow over the coming decade (GMFM 2011), the sector will not drive net new employment.

1.7 Despite this, the sector is undoubtedly crucial to future economic success and resilience – as a strong base of profitable and innovative firms has many benefits for the wider economy, in terms of innovation, investment and skills development. Furthermore, as the process of de-industrialisation continues, it is likely that the manufacturing firms that do survive and prosper will be the more advanced and globally competitive firms, rather than traditional high-employment low-value producers. A strong advanced manufacturing sector therefore remains critically important for Greater Manchester, since it involves high-value, high-skill, research and technology-intensive activity that delivers international competitiveness and increased productivity for the conurbation.

RECOMMENDATIONS

1.8 As manufacturers become increasingly 'advanced', they are seeing higher proportions of their staff engaged in office-based, service-type activities, with their actual production becoming more capital and technology-intensive, requiring less space and less labour inputs. As such, the characteristics of advanced manufacturers, typically requiring a mix of office and light industrial space, are becoming closer to that of service companies. This in turn means that the needs and barriers facing advanced manufacturers are also more like those facing the service sector, such as skills, premises, quality of place, and transport linkages. This reinforces rather than alters the messages in the Manchester Independent Economic Review (MIER)[1] about the appropriate priorities for increasing and supporting competitiveness. As such, there are a number of recommendations for supporting the sector:

- **Recruiting** – manufacturing has historically led the way in the recruitment and training of new entrants into the labour market through apprenticeships. There is a need for all the partners involved to refresh apprenticeships for advanced manufacturing, particularly around promoting the benefits of a career in modern manufacturing, in order to ensure quality skills and employment in the sector in the future.
- **Premises and infrastructure** – as manufacturers become more advanced, they see changing land, premises and infrastructure requirements, with greater need for office and light industrial and less floor space than traditional factory units. This has left many advanced manufacturers with a legacy of ageing premises and large sites, which they often own. There is a need for the evolving requirements of the manufacturing sector to be better understood by the planning system, recognising the ability to release portions of industrial land for other uses, which the manufacturers

[1] Manchester Independent Economic Review (2009), http://www.manchester-review.org.uk/

themselves can realise value from in order to reinvest in their own facilities. There is inevitably pressure from the firms for residential and other commercial uses than will maximise land values. These should be considered on their merits as opportunities to create modern, mixed-use developments that can retain advanced manufacturing within the conurbation.

- Streamlined **client relationship management** (CRM) of Greater Manchester's advanced manufacturers. Currently there are a number of organisations liaising with and providing support to businesses, which consulted firms found confusing – they reported that they would be more willing to engage and form relationships if there was one single point of contact. There is an opportunity with the ending of the regional Business Link service, for the key partners, MIDAS, Manchester Solutions, GM Chamber, and the Local Authorities, to work with the Manufacturing Advisory Service (MAS), potentially through the Business Growth Hub, to provide a more streamlined and proactive management of key relationships, based around an integrated CRM system.
- A critical outcome of this updated CRM is to provide the support advanced manufacturers need in terms of **reinvestment** and **exporting**. The targeting of advanced manufacturing investment by overseas companies by MIDAS is clearly an important priority for Greater Manchester, but given the overall number of opportunities available, just as important is facilitating reinvestment and expansion by our existing businesses. Since many of these businesses are foreign-owned and controlled, decisions about reinvestment are often similar to the inward investment process and therefore similar support can be provided to ensure that this reinvestment and expansion remains within Greater Manchester and the UK. And for the existing business base, Greater Manchester currently benefits from one of the largest and best supported trade teams in the country and it is important that this continues to offer support for overseas exports and trade missions to foster international linkages, particularly to the fast-growing emerging economies.
- Firms reported that they were concerned about the existence of subsidies and incentives available to manufacturers in other parts of the European Union (including Wales and Scotland), that makes exporting and reinvestment more difficult for Greater Manchester businesses. Various options exist with regards to incentivising investment and **creating a more level playing field for the UK's advanced manufacturers**:
    - ❖ MIDAS have been exploring the possibility of creating an **investment development fund**, using ERDF funds previously allocated to the NWDA. This opportunity should be taken, with a particular focus upon

the advanced manufacturing sector, where capital investment needs are larger.

- **Lobby Government to expand the exports guarantee scheme.** Whilst the Government has recently proposed various changes to the way the UK's Export Credit Guarantee Scheme works (BIS 2011 *Trade and Investment for Growth White Paper*), more can be done to create a policy that is as incentivising and proactive as in other countries. In the 2009/10 financial year, the scheme issued £2.2 billion worth of guarantees and paid out £48 million in claims (ECGD 2010) – whilst the export credit scheme in Germany (known as the 'Hermes Cover' scheme), for example, granted cover for export orders with a total value €22.4 billion in 2009, or 2.8 per cent of total German exports for the year. A further option would be the creation of a fund to specifically provide finance to those advanced manufacturers in GM that need to increase capacity to meet orders and cannot obtain short-term funding privately.

2 RESEARCH FINDINGS

MAPPING ADVANCED MANUFACTURING ACROSS GREATER MANCHESTER

2.1 Greater Manchester was the world's first modern industrial city and the birthplace of the Industrial Revolution. Whilst growth was initially driven by the textiles industry, the city rapidly developed to lead the way in all areas of Britain's global industrial might, with the label 'Made in Manchester' being a byword for quality and innovation.

2.2 However, by the 1980s, Greater Manchester had become synonymous with de-industrialisation, as traditional industries declined, factories closed and employment fell, with serious social impacts. Greater Manchester has since the 1990s reinvented itself through a post-industrial revolution that has seen new investment, new industries and new employment attracted into the city. In the decade preceding the recession, economic growth in the city was higher than the national average, matching rates seen in the South East of England.

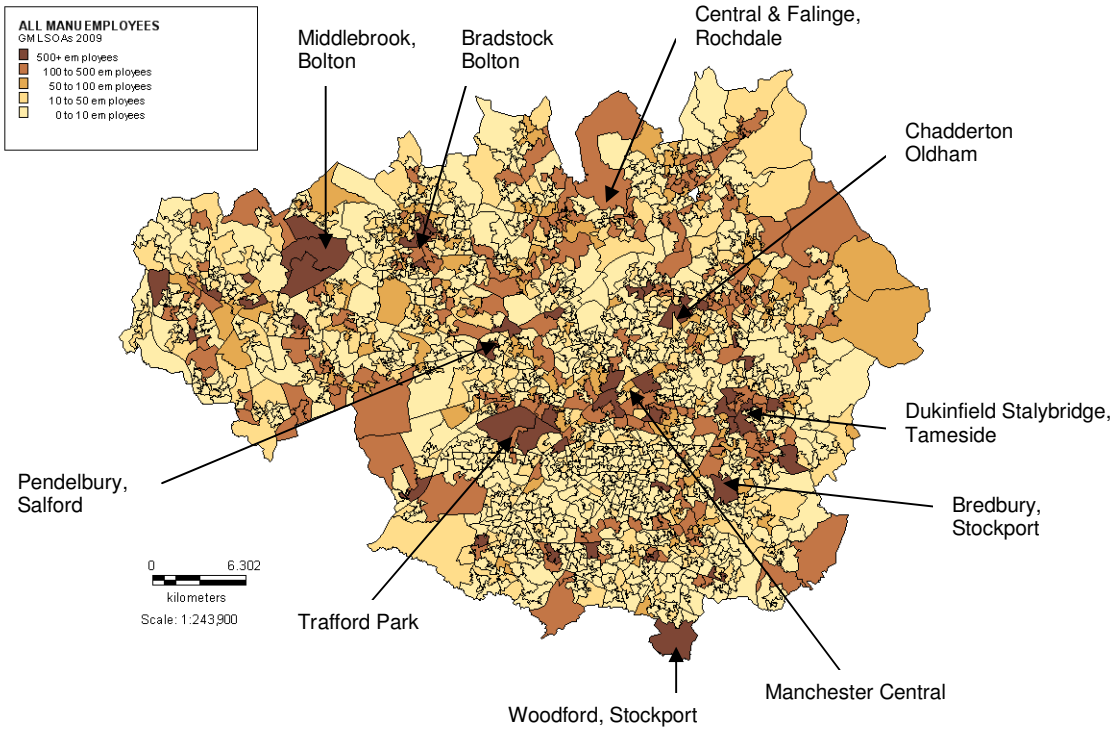
2.3 Growth has been driven by the service sector, particularly financial & professional services, which have driven employment and output (GVA) growth over the last decade. This growth has been particularly strong in the city centre and surrounding areas, such as Salford Quays. And professional services are forecast by the independent Greater Manchester Forecasting Model to continue to drive employment growth across the conurbation over the coming decade.

2.4 Over this period, the structure of Greater Manchester's economy has changed markedly – with a rapid decline in manufacturing employment (-37.6% between 2000 and 2008 – a loss of over 70,000 jobs) and other industrial sectors, and service sector employment rising rapidly in its place.

2.5 However, Greater Manchester's history means the conurbation still retains strengths in traditional manufacturing and logistics. Despite the decline of manufacturing over recent years, the sector remains a significant employer across the conurbation, still accounting for over one-in-ten employees (10.3%). The percentage varies across Greater Manchester as a whole and rises to 1 in 5 in some districts.

2.6 The conurbation retains above average employment in its historically strong manufacturing sectors of textiles and food & drink, as illustrated in the map overleaf. Particularly high concentrations of employment exist in the north of the conurbation – particularly around Middlebrook in Bolton – with strong pockets of manufacturing employment also present towards the conurbation core – in Trafford Park and central Manchester.

Figure 1 - All manufacturing employment in Greater Manchester, by LSOA, 2009



Source: ONS, Business Register and Employment Survey, 2010

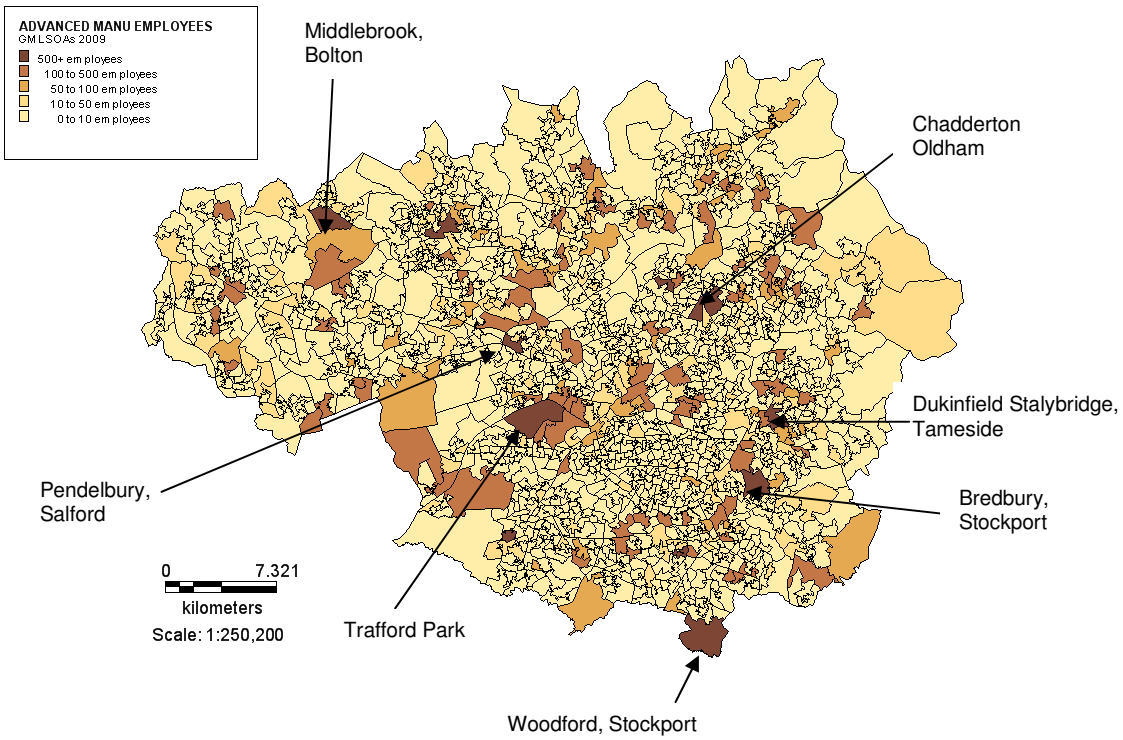
2.7 Defining which of these manufacturing activities are 'advanced' is not easy. There is no straightforward way to define advanced manufacturing using statistics, since it is not simply a distinct sector, but rather an approach to manufacturing. For example, a low-tech product could be produced using advanced manufacturing techniques, whilst a hi-tech product might simply be being assembled or localised in GM in a low-value way. However, perhaps the best practical option is offered by the OECD's activity based definition (see Appendix for full details and methodology) – which separates general manufacturing activities in to advanced and high-tech (an especially advanced sub-set) activities.

2.8 Using this definition, our research shows that within the manufacturing sector approximately one third of all manufacturing employees work in the advanced manufacturing sector in Greater Manchester (31.2%) – defined here as high-to-medium technology manufacturing. Significantly, Greater Manchester has over 38,000 employees working for advanced manufacturers – a higher number than any comparator conurbation except for Birmingham (59,000).

2.9 Figure 2 illustrates that the spread of employment in advanced manufacturing across Greater Manchester. It shows that employment for such manufacturers is

spread more broadly across the conurbation than it is for manufacturing as a whole, although the north of the conurbation and the conurbation core still hold the strongest concentrations of employment. Within Greater Manchester, Stockport has the highest number of employees working for advanced manufacturing businesses (5,500), followed by Manchester (5,100) and Rochdale (4,600), with Bury the lowest (2,000).

Figure 2 - Advanced manufacturing employment in Greater Manchester, by LSOA, 2009



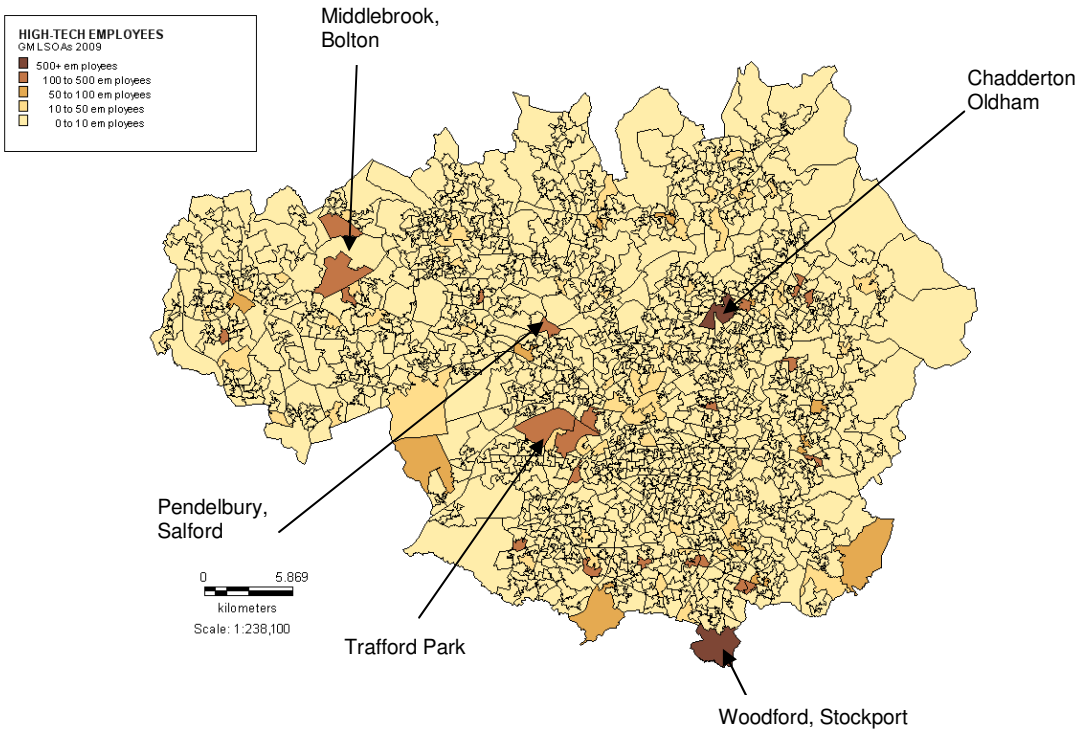
Source: ONS, Business Register and Employment Survey, 2010

2.10 Our research also shows that Greater Manchester has a strong base of the most advanced forms of manufacturing activity – high-technology manufacturing (a specialised sub-set of advanced manufacturing). Whilst high-technology manufacturing comprises a very small proportion of the overall business base, and a relatively small proportion of manufacturing as a whole (just 0.21% of the overall business base in Greater Manchester – the same proportion as nationally – and just 3.04% of all manufacturing units), Greater Manchester has more high-technology manufacturers (195), and these comprise a higher percentage (0.21%) of the business base than in any of the other comparator city regions.

This is significant as it reinforces the fact that Greater Manchester has a comparatively strong base of advanced manufacturers in a national context.

2.11 Looking at the spread of high-technology businesses across the conurbation clearly highlights how small a proportion of employees are involved in high-technology manufacturing – with employment being most concentrated in Stockport (2,000 employees), Oldham (1,500) and Manchester (1,300). It is also significant that advanced manufacturing activities are actually more prevalent in the conurbation core and south, rather than the traditional manufacturing centers in the north of the conurbation.

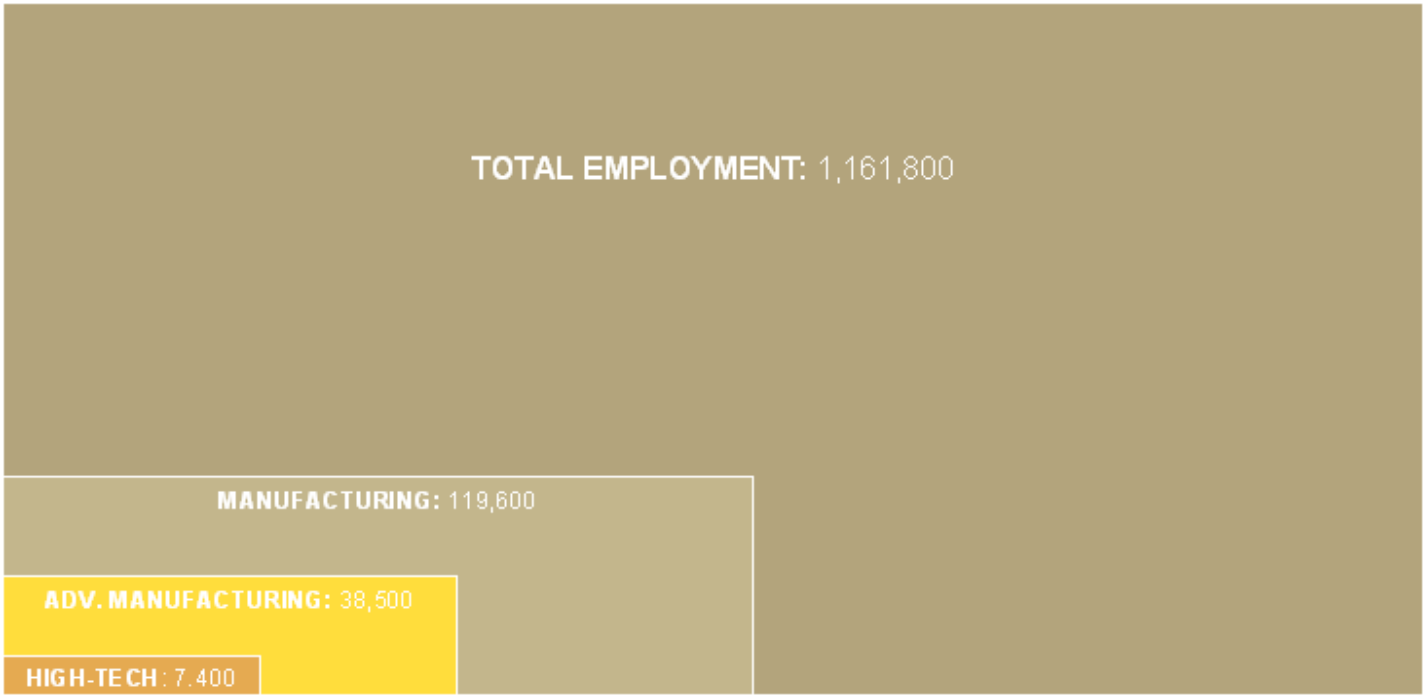
Figure 7 - High-technology manufacturing employment in Greater Manchester, by LSOA, 2009



Source: ONS, Business Register and Employment Survey, 2010

2.12 Finally, Figure 8 overleaf highlights the comparative employment sizes of advanced manufacturing and high-technology manufacturing within the overall Greater Manchester economy. This serves to illustrate how advanced manufacturing (and especially its high-tech component) remains relatively small in employment terms, despite Greater Manchester having comparatively high levels of advanced manufacturing employment.

Figure 8 - Advanced and high-technology manufacturing employment as a proportion of overall employment in Greater Manchester, 2009



Source: ONS, Business Register and Employment Survey, 2010

CASE STUDIES

2.13 The primary research conducted as part of this study adds depth to the analysis of the secondary data, thereby providing a fuller understanding of the advanced manufacturing sector locally. The case studies covered companies across Greater Manchester within sectors such as automotive, chemicals, electrical engineering, energy, food and drink and, although the sample of firms is not perfectly representative, it does provide a broad coverage across Greater Manchester and across sectors. Companies were assured anonymity to ensure they felt able to respond truthfully.

2.14 The overall results from case studies reveal that advanced manufacturing companies in Greater Manchester are continuing to grow in terms of productivity, with strong growth in sales and profits evident. However, employment broadly remained static, with the overall trend in manufacturing employment being downwards, even within hi-tech manufacturers. As outlined in the previous chapter, independent forecasts by Oxford Economics in the Greater Manchester Forecasting Model predict that whilst the decline in manufacturing employment will slow over the next decade, it will continue to fall.

2.15 The transformations that will enable manufacturing in Greater Manchester to compete globally are already underway and supporting growth with most of the case study companies. However, translating this into employment growth will remain difficult, as pressure upon manufacturers to maintain global competitiveness through investments in capital and technology in order to substitute for labour inputs continue to intensify.

2.16 A large proportion of the case study companies are now internationally owned and/or part of global supply chains. The case studies illustrate that it is important not to understate the continued key role of Europe, the USA, Australia and Japan to advanced manufacturing – in terms of the customer base these countries provide and in terms of supply chains – despite the undoubtedly crucial role that the BRIC nations (Brazil, Russia, India and China) are playing to present and potential future markets for most of the case study companies.

2.17 It is clear however that, for many advanced manufacturing companies that export large proportions of their output (whether in the form of products or related services), the full value of this does not always flow back to Greater Manchester or the country as a whole. In addition, decision making often happens elsewhere in the world, meaning that Greater Manchester businesses are often having to compete internally within their own organisation for investment. It is therefore just as critical that Greater Manchester and Great Britain is able to offer the right overall environment in terms of skills, infrastructure, business support, and quality of place, in order to support investment in existing manufacturers as to attract new international investment.

2.18 As manufacturing increases in value and knowledge intensity, it increasingly needs to draw upon higher-level skills. Many of the Greater Manchester manufacturers reported skills shortages and difficulties in recruiting the appropriate talent, particularly in engineering, especially mechanical and electrical. There is also a concern that as employment fluctuates in the sector in response to changing economic conditions, that there is a risk of losing skills and therefore competitiveness against other advanced manufacturing nations. The MIER stressed the critical importance of raising skills levels within Greater Manchester if it is to close its productivity gap with the best performing areas of the country, and advanced manufacturing can be a particularly effective route to deliver this growth given its increasingly technology-intensive nature.

2.19 The case study findings identify access to finance, energy costs, security of supply and regulatory issues as real barriers to growth for advanced manufacturing businesses in Greater Manchester. Moreover, the results reveal that as manufacturing becomes more advanced and increasingly service-oriented in its activities, that barriers to growth are coming to more closely resemble those facing the economy as a whole, for example skills.

2.20 The interviews revealed a variety of areas where it was thought public sector agencies (whether in central or local government) could better help advanced manufacturers. These particularly focused upon reducing bureaucracy and the burden of 'red tape', managing and improving infrastructure (especially roads and transport infrastructure in Greater Manchester) and assisting in improving premises or easing planning restrictions. Whilst many of these are issues that would likely be relevant to businesses in all sectors, they were very prominent in discussions with advanced manufacturers. Notably, there could be a role for local authorities and other agencies to address most of these concerns.

2.21 Another recurring theme amongst those firms that were interviewed focused on the fact that manufacturing companies in Britain (particularly SMEs) do not receive the same amount or kind of support that competitors in Europe receive – whether this is grants or subsidies (especially during a downturn) or general business support and assistance in growth. This is a concern that has been echoed elsewhere in the UK and reflects the fact that rival trading nations, particularly in Europe, often offer a greater deal of support and protection to their manufacturers. And example of this is the UK's Export Guarantee Scheme: in the 2009/10 financial year, the scheme issued £2.2 billion worth of guarantees and paid out £48 million in claims (ECGD 2010) – whilst the export credit scheme in Germany (known as the 'Hermes Cover' scheme), for example, granted cover for export orders with a total value €22.4 billion in 2009, or 2.8 per cent of total German exports for the year. Whilst the Government has recently proposed various changes to the way the UK's Export Credit Guarantee Scheme works (BIS 2011 *Trade and Investment for Growth White Paper*), it is evident that much

more can be done to create a policy that is as incentivising and proactive as in other countries.

2.22 It was also clear from the case study analysis that advanced manufacturers are seeking research expertise from wherever it is considered strongest and not simply going to local universities. It is therefore also important that the sector specialism of technology and innovation centres relate closely to genuine research and business strengths, if advanced manufacturers are to realise maximum benefit from these investments.

2.23 Manchester Airport and the nearby sea ports are crucial to the companies for distribution purposes. Looking to the future, the Greater Manchester LEP has created an Airport City RGF bid. Part of this bid will involve an advanced manufacturing building which will combine production facilities with R&D and office space. Manchester Airport Group has been in discussions with a number of businesses in regard to this type of building. Another part of the project will centre on a logistics building/warehouse.

COMPANY ACCOUNTS ANALYSIS

2.24 This analysis looks at a sample of advanced manufacturing firms from across Greater Manchester and analyses their profitability and employment levels over a three year period.

2.25 Data was obtained using the Corpfin Experian business database – which allows for access and analysis of publicly-filed company accounts data (2010 being the latest consistent date available where accounts data has been filed). Firms were identified by SIC code using the OECD advanced manufacturing definition (see Appendix for full description) and their registered headquarter address. A total of 152 firms were identified with registered headquarters in Greater Manchester as well as a full three years of accounts data available for the purposes of analysis and comparison.

2.26 Analysis of the sample group of companies provides a number of interesting insights in to what a 'typical' advanced manufacturing firm might look like in Greater Manchester. In terms of the sectoral composition of these companies, the majority of the sample are classified as operating in the broad sectoral areas of 'manufacture of computers and process equipment' (especially those near the conurbation core), the 'manufacture of electronic components' (again, even more notably for those in the conurbation core) and the 'manufacture of aircraft and related components' (mainly related components) – and are therefore largely engaged in the specialised production of technical products. Some of the other sectoral activities present include pharmaceutical manufacturing, television and radio products manufacturing and locomotive machinery manufacturing.

2.27 The data on employment illustrates clearly that the vast majority of these advanced manufacturing firms are small to medium sized enterprises (SMEs) – with an average number of 27 employees per firm (approximately 4,000 employees employed across the sample group of companies). Average sales turnover for these firms is £4m (with total sales turnover of over £540m across the sample as a whole). This supports the data analysed previously in this report, which found that advanced manufacturing employees comprise a very small proportion of overall employment (0.64% for Greater Manchester) – and that advanced manufacturers are unlikely to be large-scale employers.

2.28 Analysis of the end of year reported profits of the sample firms shows that there has been strong growth in profits over the last three years, despite this being a particularly hard economic period for most companies across all sectors. Over the three year period there was a median[2] growth in profits of +55% (+54.9%). Although the data doesn't allow for a more rigorous analysis of the source of these profits and the effect of foreign demand and export strength for example,

[2] A median average has been used here (instead of a mean average) to negate the skewing effect of a small number of very large advanced manufacturers in the sample.

this would indicate that many advanced manufacturers in the conurbation have done relatively well – at least in terms of sales and profits – in recent years, whilst a large proportion of the business base has struggled. This is important as profits are a key component of traditional measures of productivity – through Gross Value Added (GVA) for example – and higher profits are therefore indicative of increasing productivity.

2.29 Crucially however, this relative success has not been matched by employment growth. Despite average growth in profits of over 50%, the median growth in employment over the same period was exactly 0% – indicating a period of jobless growth across the sample of firms. This again supports previous data analysis in illustrating the fact that advanced manufacturing has not been immune to the trend of declining employment and increased capital-intensity in the manufacturing sector – and despite performing seemingly well when compared to broader manufacturing, this does not generally translate to a general increase in advanced manufacturing jobs.

SUMMARY

- Analysis conducted using Corpfin company database and analysing accounts data (on profitability, sales and employment) for a sample group of advanced manufacturing firms in Greater Manchester. Comparisons also with sample group of mixed-sector Greater Manchester firms.
- 152 firms in advanced manufacturing sample, employing over 4,000 employees
- Employ an average of 27 employees, with an average of £4m sales (total sales of sample = £543m)
- Majority of the sample firms involved in:
  - Manufacture of computers and process equipment (esp. city centre)
  - Manufacture of electronic components (esp. city centre)
  - Manufacture of aircraft and related components

RESULTS

- Strong growth in profits over ¾ year period (+54.9% median average) and sales (+47.1% median average) over last 3 to 4 years
- However – although some firms rapidly expanding and others cutting-back on staff – overall employment remained static over same period (0.0% median average)

3 CONCLUSIONS

3.1 The manufacturing sector has changed immeasurably in recent decades, and British manufacturers today look very different to the manufacturers of the past. As low-value labour-intensive trade activities have increasingly moved to lower-cost locations elsewhere in the world, many traditional low-value high-employment manufacturers of previous times have gone out of business. The manufacturing that has survived is more likely to involve precision or advanced forms of production, as well as a variety of supporting research, development or product service activities (what the Work Foundation have termed 'manu-services').

3.2 Despite declining employment across all forms of manufacturing, productivity has risen rapidly in the sector as new production processes and technologies have been employed and as manufacturers have moved to exploit opportunities in research, design and services that support manufacturing production and offer further value to manufactured goods.

3.3 Whilst employment in the sector remains small compared to manufacturing as a whole (see Figure 8 previously), our analysis shows that Greater Manchester has a strong base of such advanced manufacturing – both in terms of both the number of businesses and the number of employees. The conurbation has over 38,000 employees working for advanced manufacturers – approximately a quarter of all manufacturing employees. This is a higher number than all comparator cities (including London), except for Birmingham. Our research also illustrates that Greater Manchester has a comparatively strong presence of firms engaged in the highest-end forms of advanced manufacturing. Although high-technology manufacturing comprises only a very small proportion of overall manufacturing (about 3% of the manufacturing base – Greater Manchester has more high-technology manufacturers than key comparator cities outside London, with almost 200 businesses engaged in specialist high-technology manufacturing across the conurbation.

3.4 There is therefore a strong base of advanced manufacturing within the conurbation, and advanced manufacturing is evidently area in which GM can continue to compete globally: the challenge for GM is to ensure that traditional manufacturers are able to move up the value chain, and GM is able to attract further advanced manufacturing activities into the conurbation. It is also worth stating that many advanced manufacturers will continue to rely upon the existence of more general forms of manufacturing locally, to supply components and to deliver the less advanced aspects of certain manufacturing processes. Indeed, research elsewhere has highlighted the important role of less advanced forms of manufacturing in the supply-chain – as both recipients and carriers of

high-technology innovations from more advanced manufacturers.[3] Evidence from elsewhere, and particularly from Germany, shows that advanced manufacturing is not an activity or process that occurs in isolation, separate from the rest of manufacturing. It is clear that a strong base of manufacturing is required across the value-chain, and across sectors, to supply, support and drive growth in more advanced forms of manufacturing.

3.5 Our primary research suggests that newer forms of manufacturing are often looking to locate in the same types of areas as growth service sectors, consolidating patterns of economic agglomeration around existing and new growth nodes, and of restructuring in former industrial areas. The issues for these manufacturers are similar to those faced by growth service sectors – generally being issues such as premises and sites, transport connectivity, reducing bureaucracy and red tape, and improving access to international markets and skills.

3.6 The case studies also illustrate the fact that many of Greater Manchester's advanced manufacturers believe they face a distinct disadvantage to many of their direct competitors in Europe and even the devolved administrations of the UK, who receive direct assistance from their governments, in terms of grants, subsidies, growth assistance and premises. Although many of GM's firms are performing well, a recurring theme was that companies in other locations often receive much easier to access direct help from the public sector.

3.7 However, whilst a rejuvenated advanced manufacturing sector can offer important diversity for Greater Manchester's economy, previous performance shows that it is unlikely to generate net new employment even in areas of the conurbation where manufacturing remains the largest sector. Whilst it is significant that our research shows that more advanced forms of manufacturing have been declining at a slower rate than apparently lower-value manufacturing activities in Greater Manchester, and that this decline has also been far less pronounced than it has been at a national level, employment in all manufacturing sub-sectors has clearly been in long-term decline.

3.8 This is supported by results from the case studies that reveal that advanced manufacturing companies in Greater Manchester are continuing to grow in terms of productivity, with strong growth in sales and profits evident – but corresponding increases in employment have not generally been apparent amongst such firms. These trends are supported by the analysis of advanced manufacturers' profits and employment rates over a three year period: whilst the sample group of firms showed strong profits growth over a generally difficult trading period (+54.9%), employment over the same period remained static (+0.0%) on average. This is also supported by recent research conducted by New Economy on the

[3] Hirsch-Kreinsen (Jan. 2011), *The Relevance of Industrial Production*

relationship between exports and employment – which has found that increasing international linkages through exports are vital to creating a more productive, innovative and resilient business base, but will be unlikely to lead to job creation.

3.9 Moreover, our case studies reveal that a large proportion of advanced manufacturing companies are now internationally owned and/or part of large global supply chains. As such, decision-making for these companies often happens elsewhere in the world, meaning that Greater Manchester businesses are often having to compete internally within their own organisation for investment (for many companies that export a large proportion of their output, whether in the form of products or related services, the full value of this activity does not always flow back to the Greater Manchester economy).

3.10 Furthermore, it is clear from both the primary and secondary research that, in order to compete globally, all types of manufacturing need to exploit ever higher levels of skills. Whilst parts of Greater Manchester offer a strong higher-level skills base, many residents suffer from low or no skills that exclude them from the labour market – leading to a productivity gap between Greater Manchester and the best performing parts of the country – an issue that was highlighted starkly in the MIER. Two significant drivers of this are poor skills and low internationalisation amongst Greater Manchester businesses; and this issue is particularly acute in many of Greater Manchester's former industrial areas, where many traditional manufacturing skills are no longer well suited the needs of modern manufacturing businesses. This means that even a renaissance of the advanced manufacturing sector is unable to tackle the, leaving a serious legacy of worklessness in these areas. Dealing with these issues are therefore of crucial importance if Greater Manchester is to consolidate and grow its existing base of advanced manufacturing and ensure its large manufacturing base is able to compete in an increasingly competitive international arena.

3.11 However, whilst advanced manufacturing is undoubtedly an area that Greater Manchester can compete in and an area that can deliver increased productivity and profitability, it is important to recognise that, however resilient advanced manufacturing may prove to be relative to manufacturing overall, it is seemingly unlikely to be an area where net new jobs growth will be seen. It is therefore just as critical that Greater Manchester and the country as a whole is able to offer the right overall business environment for skills, infrastructure, business support, and quality of place for all potential growth sectors.