

UK MANUFACTURING IN 2012

Institution of
**MECHANICAL
ENGINEERS**

Generating between 11% and 12% of the UK's overall wealth, 60% of exports and 2.6 million jobs, manufacturing continues to play a vital role in the nation's economy. In comparison to many other nations, the UK has one of the leanest and most efficient manufacturing sectors in the world.

Yet between 1984 and 2009, the UK has seen the lowest growth out of the top 25 global manufacturing nations at 13%.

The UK's manufacturing output recently slipped to ninth in the world rankings, just ahead of India. To ensure we remain within the top ten, the UK needs to reinvigorate and exploit its manufacturing potential. No nation in the top ten has maintained its position as a leading economy solely on the basis of its financial or service sectors.

The Institution of Mechanical Engineers believes that attention and investment of resources in four key areas: capital facilities, product development and technology, people & skills and management systems will stimulate growth in the UK's manufacturing sector.

The Institution of Mechanical Engineers recommends:

- That the Government sets out a clear national industrial strategy to provide industry and academia with a framework to deliver growth in the manufacturing sector. This industrial strategy needs to be developed with a cross-party consensus to ensure UK industry has long-term political commitment.
- That the Government and the financial sector work together to deliver greater capital investment in new production plants and machinery along with training. An industrial bank is one option that can assist manufacturers with access to funds for investment, providing options such as asset management loans.
- Industry, academia and the Government need to support and publicise the work of the UK Commission for Employment and Skills (UKCES) to increase the number of people and the skill levels required to meet the future requirements of manufacturing. Only then can we develop programmes to deliver an expanded manufacturing sector and increase its contribution to the economy.
- That the new High Value Manufacturing Catapult Centre should expand its role across all manufacturing sectors rather than be restricted to its own research programmes.

UK MANUFACTURING IN 2012

WHAT IS MANUFACTURING?

Manufacturing is more than just the process of making things. Currently generating between 11% and 12% of the UK's overall wealth, 60% of its exports and 2.6 million jobs, it plays a vital role in the UK economy. Over the last 20 years manufacturing has changed significantly: becoming leaner and more agile, improving its competitiveness and reducing costs. This has led to a change in the way in which manufacturers described their processes and approach. Previously it was the conversion of raw materials into finished goods. Today, manufacturing is defined as the process for turning ideas into saleable products realising the economic benefit of technology and research. It creates future value from investments made today.

Manufacturers take a life-cycle approach to the way they work. They are involved from concept design, through the design process, into the manufacturing and production phases, which then deliver to the in-service and then eventual disposal or recycling and re-use of the product.

The UK is an international leader in manufacturing industries such as aerospace and pharmaceuticals, and recognised as having an advantage in medium to high-technology manufacturing. However, unknown to many, the UK's largest manufacturing sector is that of food and drink, which employs more than 400,000 people and has output rising by 6.6% in 2010^[1/2].

ECONOMIC CONTEXT

Worldwide drivers of manufacturing

By the end of the 21st century it is estimated that there will be 9.5 billion people living in the world. 75% of these will be located in urban settlements, striving for better standards of living and driving up demand for efficient and cheaper products and services^[3]. As demand increases, the supply and costs of raw materials will have a significant impact on manufacturers. The world has also begun to see and feel the impacts of climate change, which can be viewed as both a threat and an opportunity for manufacturers working to make products for the low-carbon market. Current energy and climate change policies could have added 12% to the energy bills of manufacturers by the end of 2011, and these are estimated to rise to 20% by 2020^[1].

World manufacturing output

Over the period 1970–2010, the world's output of manufactured goods has more than trebled (from \$2.7tr to \$8.2tr), which represents an annual growth rate of 2.93%^[4]. At present 25 countries across the globe produce 90% of world manufactured output. The largest manufacturing country is China, just ahead of the USA, Japan, Germany and Italy. The UK has recently lost its sixth place position to Brazil and is now ninth, just ahead of India, but behind South Korea and France.

Over the last 25 years, developing countries have provided a disproportionate share of manufacturing growth. During this time the UK has seen the lowest growth at 13%.

Clearly, with manufacturing exports still being a key contributor to the UK economy, the potential to slip further is worrying.

HOW IS UK MANUFACTURING PERFORMING?

UK manufacturing output

Long-term trends in UK manufacturing output are not easy to discern. Over the period 1982–2007, total output increased by 50%, an annual growth rate of 1.6%. Recessions and the growth of the financial/service sectors have hit UK manufacturing hard; this is confirmed as total output is currently unchanged from ten years ago. **Figure 1** shows how the output has changed since the 1970s, with the recessions in the early 1990s and in 2008/09 clearly visible. International growth at 2.93% of manufacturing output (indicated by the smooth line) shows how the UK has fallen behind other countries over time. Economic data shows that UK manufacturing is growing 6.5 times slower than the international trend as it has grown just 0.45% pa over the last 45 years.

The key factor is that UK manufacturing still provides jobs and encourages wealth creation. Manufacturing exports are three times as large as those from financial services or all the other knowledge-intensive services combined. A 10% rise in manufactured exports, combined with a similar fall in manufactured imports, would generate a £45bn improvement in the balance of payments, which is equal to the total UK net earnings from financial services and insurance, or more than 1.5 times that contributed by all other services^[5]. We clearly need a long-term national strategy to ensure that we boost the contribution made by the manufacturing sector.

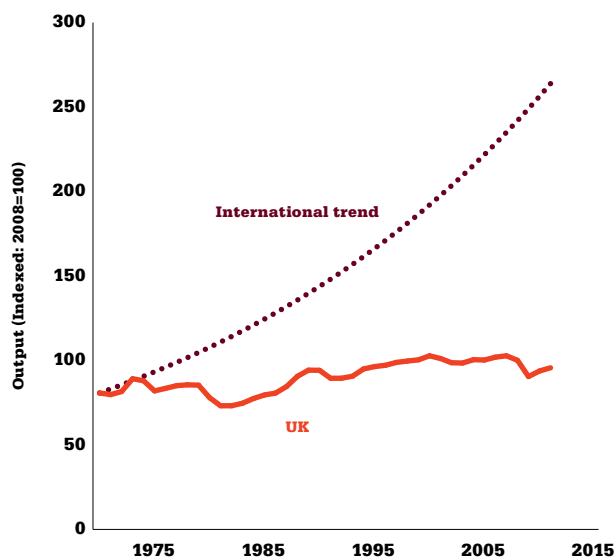


Figure 1
UK manufacturing output^[2]

UK productivity and employment

A key factor in the UK is that there has been a long-term trend in the manufacturing sector of productivity increasing by 3% pa and employment falling by 100,000 pa. This is due to manufacturers improving their processes, becoming leaner and more agile, therefore requiring fewer people. This is shown in **Figure 2**.

The result is clearly that the sector has created the impression that “there are no jobs in manufacturing”. This is quite the opposite of the growth needed and has led to a self-fulfilling downward spiral. The UK Commission for Employment and Skills predictions are the most comprehensive and show that despite these trends, we will still need significant recruitment for the replacement of existing roles, particularly through retirement. This translates to approximately 80,000 recruits each year to meet the manufacturing sector needs^[6].

Key issues for UK manufacturing

The Institution of Mechanical Engineers believes there are four areas of manufacturing where investment could add value:

- Capital facilities
- Product development and technology
- People and skills
- Management systems and processes

Investment in capital facilities

It is generally well understood that manufacturing is a capital-intensive process. This process requires long-term investment across the sector in its production assets to enable competitiveness, especially in high-labour-cost countries. Investment in our capital facilities provides the basis to improve productivity, increase capacity and increase the speed at which businesses can introduce new products. This is demonstrated through data from the Institution of Mechanical Engineers' Manufacturing Excellence (MX) Programme, which suggests that the aim for UK-based facilities should be to reduce direct labour costs in a product to <10% of total costs in order to be competitive^[7]. If we can enable this to happen within the UK, it doesn't matter where we make the products. This has been demonstrated through companies such as Caterpillar, which has been investing in its plant and has brought back its manufacturing to the UK.

But manufacturing investment has however more than halved over the last 10–15 years, with evidence showing that UK manufacturing spends less per employee or per pound of Gross Value Added (GVA) than its competitors, with the UK capital per worker being 40% to 60% lower than Germany or France^[8/9]. More needs to be done to communicate alternative ways in which manufacturers can gain access to funds, using methods such as investment in the form of asset management. An industrial bank is one option, but ignorance of funding and over-complexity of Government aid schemes remain key issues.

Investment in product development and technology

In 2010 BIS published a research and development (R&D) scoreboard^[10]. This showed that the UK's top 1,000 R&D performing companies spend about £25bn per year on R&D. Notably this held up well during the recession. However the UK spend seems to be concentrated in about 100 companies, which suggests that there is a long tail of companies with very low R&D spend. By comparison it is worth noting that US companies spend £112.5bn per year and German companies £38.3bn per year on R&D.

UK companies originate a large number of patents through research. China and the East generally adopts a different approach, which concentrates on extracting value from R&D and placing more investment in the development of commercial products. This has led to them now having a portfolio of traditional products, but also a stronger position with recent technologies than might traditionally be expected.

It is widely forecast that the “Patent Box” changes to the UK tax system will have a significant impact on technology and the exploitation of Intellectual Property (IP), reinforcing this crucial transformation of UK manufacturing into this high-value sector. The £25m grant funding in the new High Value Manufacturing Catapult is also to be welcomed as a further way to emphasise the way forward for the UK in this sector. It must not however just focus on its own small research interests, but instead spread its influence as widely as possible across the manufacturing sector.



Figure 2
UK productivity and employment^[11]

Investment in people and skills

The UK currently has four universities in the QS World top ten university rankings, with Cambridge holding the top spot^[12]. It is well documented that we need to encourage the younger generation to take STEM subjects, but with unemployment across all ages at high rates, it is not just the younger generation we should be encouraging into a career in manufacturing.

Independent charity NESTA conducted a study in 2011, that showed that one in five high-growth firms reported that struggling to find the right staff is the most important barrier to success, whether due to difficulties in recruitment (14%) or shortage of skills (8%). The report documented that less than 5% of high-growth firms believe lack of management skills to be the main obstacle^[9].

It must be recognised that skilled engineers at all levels are required by UK manufacturing companies, and the fact that they are in short supply acts as a barrier to expansion of our manufacturing sector. There are some signs of improvement, with increasing numbers going into engineering and technology (E&T) degree courses, and an increasing number of apprenticeship schemes. The Government must continue to prioritise these activities to maintain this trend. **Figure 3** shows UCAS acceptance onto E&T courses over the last 14 years^[13].

Investment in management systems and processes

Management systems and processes are central to the performance of manufacturing companies according to a study conducted by Stanford University, McKinsey and London School of Economics^[14]. The study shows a strong correlation of implementation of management best practice to hard measures of performance, eg growth, productivity, return on capital. This was based on a study of 4,000 medium-sized companies in Europe, the USA and Asia. Its results showed us that the UK was middling in performance, comparable with France and Italy, but weaker than the USA, Germany and Japan. However there was a long tail of poor performers, and low skill and education in management.

The Manufacturing Advisory Service (MAS) is now a nationally operated service funded by Department for Business, Innovation and Skills (BIS) and the European Regional Development Fund. MAS has the ambition to help manufacturers improve their process productivity, driving out waste and reducing costs while adapting to become more energy-efficient and ultimately grow their business. It is important that MAS is initially free to small and medium-sized manufacturers, and that grants are available. In order to survive in these times, manufacturers must ensure that they have applied rigour to their processes across the business. Benchmarking against international standards, such as the Manufacturing Excellence programme, remains the crucial test of manufacturing competitiveness.

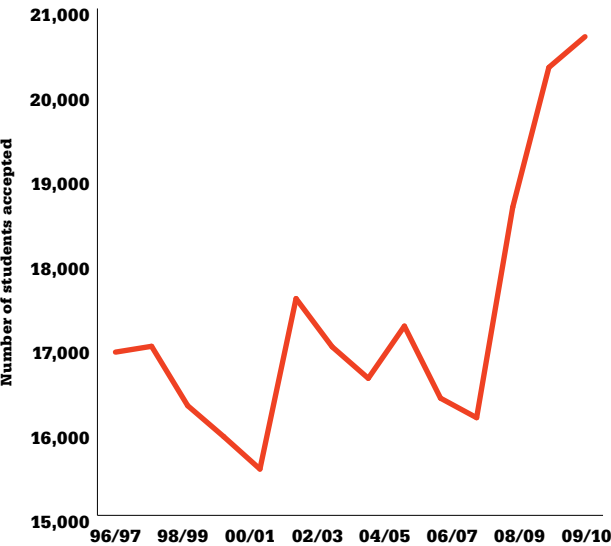


Figure 3
UCAS acceptances on Engineering & Technology courses^[12]

RECOMMENDATIONS

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To ensure this happens, the Institution of Mechanical Engineers recommends:

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REFERENCES

- ¹ DODS. Manufacturing in Great Britain. London: DODS, 2011.
- ² Office for National Statistics. Index of Production – December 2011. London: ONS, 2011.
- ³ Institution of Mechanical Engineers. Population: One planet, too many people? London: Institution of Mechanical Engineers, 2011.
- ⁴ UN: National Accounts Main Aggregates Database.
- ⁵ The ERA Foundation's 4th report on the sustainability of the UK economy in an era of declining productive capability – February 2010.
- ⁶ UKCES Working Futures 2010–2020, Evidence Report 41, 2011.
- ⁷ Institution of Mechanical Engineers. MX Awards 2000–2010.
- ⁸ EEF. Strategies for Success, 2007.
- ⁹ NESTA Report, Barriers to Growth, 2011.
- ¹⁰ BIS. R&D Scoreboard, 2010.
- ¹¹ ONS, Data Series APIN, 1994–2010.
- ¹² QS. Top University Rankings 2011/2012. QS Top University Rankings. [Online] January 2012. www.topuniversities.com/university-rankings/world-university-rankings/2011.
- ¹³ Engineering UK 2012 – The state of engineering – pg 173 Table 15.17.
- ¹⁴ Stanford University, McKinsey and LSE. Management Practice and Productivity – Why they matter, 2007.

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