



UK Manufacturing: How to Fuel the Engine

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Acknowledgements

Support towards research for this Study was given by John Mills and the Institute for Policy Research. The authors would also like to thank David Cowan for his support and contribution in the preparation of this report.

This paper is one of a series part-funded by the Politics and Economics Research Trust (registered charity no. 1121849), commissioned from the UK's leading think tanks and policy organisations on the theme of Rebalancing the Economy. The research findings of this programme were published during late 2016 and early 2017. Further details are available at www.pert.org.uk.

ISBN No. 978-1-910627-46-4

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Printed by 4 Print, 138 Molesey Avenue, Surrey

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SUMMARY

Over the past few decades the size and relative importance of the UK's manufacturing sector, relative to the overall economy, has been in decline. Its proportion of output from the sector has fallen from around 18% of GDP in 1997 to around 10% currently. Employment in the sector stands at just 2.7 million – a 60% reduction compared to 1978. Since the financial crisis, UK manufacturing has struggled – the output of the sector has yet to return to levels achieved pre 2007-2008.

Despite this decline, the UK's manufacturing sector is substantial in global terms. The UK is still the ninth largest manufacturing nation and excels in a number of activities. For example, out of all sectors of the economy the pharmaceutical industry has contributed the most to overall UK productivity. Furthermore, Britain's aerospace sector represents 15% of the global industry and the UK's vehicle industry is exporting a record number of cars.

UK manufacturing is crucial to future economic success:

- **Productivity:** The UK economy's productivity is lagging compared to international counterparts. Manufacturing could help close this gap given that productivity gains achieved in the sector are vastly more than those of the services sector.
- **Export growth:** UK manufacturing is responsible for over 40% of total exports yet accounts for just 10% of the economy. Manufacturing could help reduce the UK's current account deficit, particularly given the fall in the value of the Pound Sterling following Brexit.
- **Symbiotic nature of manufacturing and service sectors:** Evidence suggests that over time the distinction between manufacturing and services has become increasingly blurred, and that both sectors are interdependent.

- **Opportunities for reshoring:** Manufacturing activity is increasingly seeking to re-shore in Western Europe and the US. The location of manufacturing is now increasingly dependent on factors beyond the cost of labour.

The question therefore is how best to promote the UK's manufacturing sector. Many have argued that an industrial strategy is the way forward. However, it is ill advised to significantly expand government support to the manufacturing sector. Evidence suggests that aggressive industrial strategies have not been effective in boosting sectoral growth. That said, government interventions can be useful in some circumstances. These include those where government purchasing is intrinsic to the market, or in the promotion of foreign direct investment, in education and training, and measures to facilitate manufacturing activity.

Although Germany's manufacturing sector is larger than that of the UK, it is unlikely that many lessons can be learnt from its example. Institutional reform in the UK would need to work with, rather than against, the grain, of an economic system that is primarily co-ordinated through markets. It is also notable that Germany's membership of the Euro helps its domestic manufacturers, with the exchange rate being undervalued by 5 to 15%. This is an option that is unavailable to the UK.

However, there are a number of supply side challenges facing the UK's manufacturing sector, which the Government will need to address. These include:

- **A skills shortage:** Three quarters of companies struggle to recruit and two thirds of manufacturers cite a lack of technical skills among applicants.
- **Problems with electricity policy:** The potential shortfall in UK energy supplies has been identified as a reason for concern among manufacturers.
- **Airport capacity:** Air freight tonnage grew until 2000, but has since that time it has largely stagnated. This stagnation has coincided with growing capacity constraints at Heathrow and the inability of the London hub to grow in terms of Air Transport Movements.
- **Ports:** Ports are already a vital strategic asset for the UK economy, accounting for 96% of all trade volume and 75% of trade value. The Government will need to examine ways of allowing UK seaports to thrive.
- **Energy costs:** Electricity prices are 26% higher for energy intensive users due to energy policies, and the cost of these policies is scheduled to rise sharply by 2020. Electricity prices are also an issue for non-energy intensive industries. By 2020, medium-sized businesses would face prices 77% higher than they otherwise would be in the absence of policies.
- **Access to Finance:** Access to finance is a problem for SMEs more broadly. There is an increasingly strong need for greater competition in the banking sector if manufacturing SMEs are to start borrowing and growing again.

- **Bankruptcy laws:** UK bankruptcy law fails to provide the same level of support to struggling SMEs compared to that received by SMEs in the US.
- **The UK's NHS:** The UK performs poorly in the take up of new medicines compared to comparator countries. This means that the UK's NHS is missing out on treatments available in other parts of the world. It is also threatening the UK's successful life sciences industry, which needs the NHS to adopt innovation and pay for treatments that work.
- **Tariff and non-tariff barriers:** There are significant non-tariff barriers which have held back the growth of UK manufacturing exports. For example, procedures for testing vehicles adds a 26% cost for both the EU and the US.

PROPOSALS

- 1) **The need for new manufacturing:** The UK already performs competitively in a number of manufacturing areas and there is scope to re-shore more manufacturing to the UK. Moreover, manufacturing could help close the UK's productivity gap and boost exports. There is a huge opportunity for manufacturing exporters to take advantage of the correction in the valuation of the Pound Sterling, which – according to pre-Brexit estimates by the International Monetary Fund – has been well overdue.
- 2) **Industrial strategy:** There are already a number of government interventions in the manufacturing sector. However, the evidence suggests that a significant expansion of government support and intervention in the sector would not equate to a successful strategy.
- 3) **Boosting skills for manufacturing firms:** The Government has introduced University Technical Colleges for 14-18 year olds, which combine technical, practical and academic learning. There will be 50 such schools by 2018. There will need to be an assessment of how successful these colleges have been in boosting the skills of UK workers, and whether the programme should be expanded. There are also examples of specific colleges linked to certain industries. For example, the first national UK onshore oil and gas college was announced in 2014. The Government may want to work in partnership with business to roll out similar colleges for different manufacturing sectors in the economy.
- 4) **NHS & Pharmaceutical Sector:** One of the major problems in the UK healthcare system is the slow take up of innovative medicines. This affects patients and threatens both the future of life sciences and the pharmaceutical sector in the UK. There is a need for NICE to update its methods and decision making processes, so that the UK's regulatory regime is fit for the current and

future medicines pipeline. The Government should also seek to connect the UK's pharma sector with the NHS to help spur the adoption of innovation – as was recently recommended by the Accelerated Access Review.

- 5) **Electricity Policy:** The UK Government should commission a review of the impact of high electricity costs on manufacturing firms, particularly the UK's energy intensive firms that currently face limited compensatory measures. It is particularly important that UK manufacturers are not penalised compared to their EU counterparts. This, among other things, will likely involve repealing the unilateral Carbon Price Floor. The Government must also ensure that preparations are in place for a thriving shale gas industry by the 2020s.
- 6) **Airports:** It is welcome that the Government has indicated its support for Heathrow expansion – yet a number of hurdles remain. The parliamentary vote has been delayed further. It is vital that the Government gives certainty for manufacturing firms – and other businesses – about the expansion of airport capacity in the South-East of England.
- 7) **Free Ports:** Free Ports are areas that, although inside the geographic boundary of a country, are considered outside it for customs purposes. This means that goods can enter and re-exit the port without incurring the usual import procedures or tariffs – incentivising domestic manufacturing. It is also notable that UK Ports are often in areas of relatively high socio-economic deprivation, which adds to the case for promoting Free Ports. Foreign trade zones already operate all around the world – except in the EU. The Government should seek to introduce “Free Ports” post-Brexit to boost manufacturing industries and coastal areas.
- 8) **Access to Finance:** If retail banks are to become more innovative and responsive to the diverse needs of manufacturing SMEs, as well as customers in general, then there must be greater competition within the banking sector. This could include measures such as the promotion of challenger banks.
- 9) **Making Bankruptcy Law Work for Entrepreneurs:** In 2002, the Labour Government passed the Enterprise Act which reformed administration procedures for bankrupt businesses so more companies could be rescued, but it only applied to limited companies or partnerships, not unincorporated SMEs. This has left some SMEs vulnerable when they run into difficulty as banks can then exploit the situation by forcing them to pay high management fees and high interest rates. To remedy this situation, a new Enterprise Bill should be introduced.
- 10) **Tariff & non-tariff barrier policy:** The Government's Brexit strategy should include the following priorities. Instead of pursuing EEA membership, the UK should join EFTA and negotiate a free trade agreement with the EU regarding goods and services. The CETA free trade agreement between Canada and the EU provides an example of the kind of trading relationship which would benefit the UK and the EU. Furthermore, a bilateral free trade agreement with

the US should be a top priority for the Department for International Trade. The new Republican administration's trade policy is likely to be less accommodating to lower wage economies such as Mexico and China, relative to the UK and other developed nations.

1. AN OVERVIEW OF UK MANUFACTURING

Over the last year total output from production continued its long-term recovery in the UK, increasing by 1.4%. Production is measured in the national accounts as a composite of four separate economic activities: mining & quarrying; electricity, gas, steam & air conditioning supply; water & waste management; and manufacturing. Manufacturing activity is the largest component of production and provided the largest contribution to the overall year-on-year rise, the sector increasing 1.7%.¹ The main contributor to this increase was the transport equipment sector, the largest manufacturing sector in the UK, which grew by 6.6% over the course of the year.²

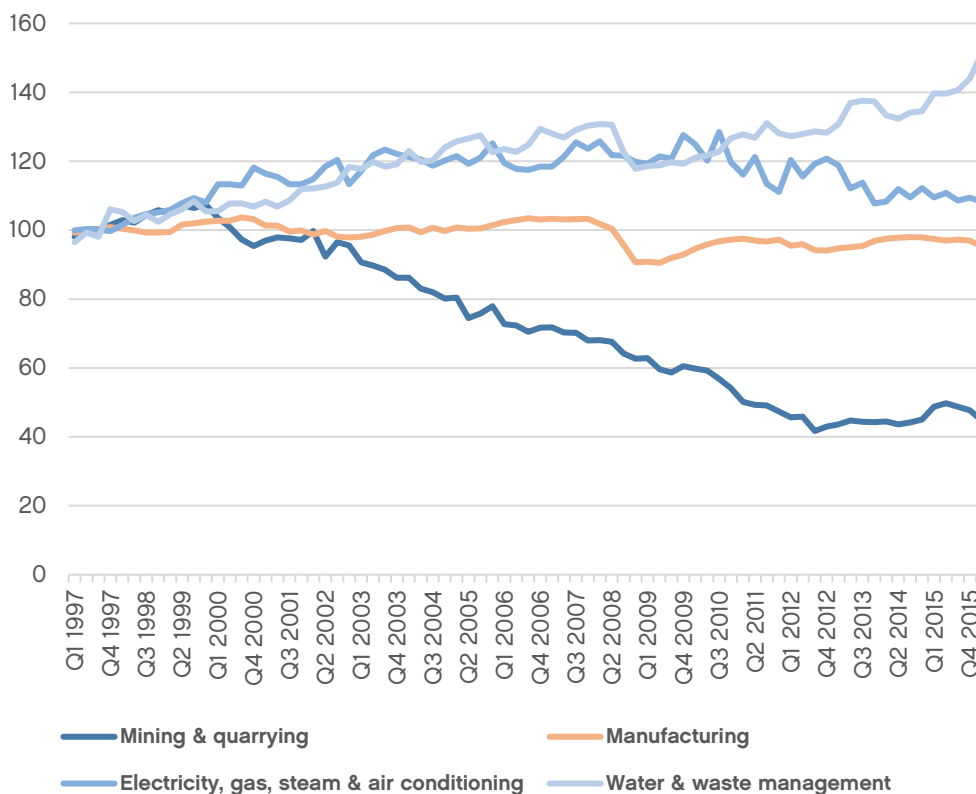
However total manufacturing output is yet to return to levels achieved in the years leading up to the 2007-2008 economic downturn – only last year, for the first time since the recession, the total output from manufacturing finally surpassed the 20 year average.³

¹ Relative to the output from other components of production, growth in manufacturing output has fared better than that of mining & quarrying, although the long-term decline of the sector is well understood. Growth of electric power generation, transmission and distribution has also levelled out since the recession, leaving water & waste management as the only productive sector to return to its long-term pre-recession growth trend.

² Office for National Statistics, *UK Index of Production: May 2016*

³ Ibid

Figure 1: Growth in Components of Production



Source: ONS UK index of production

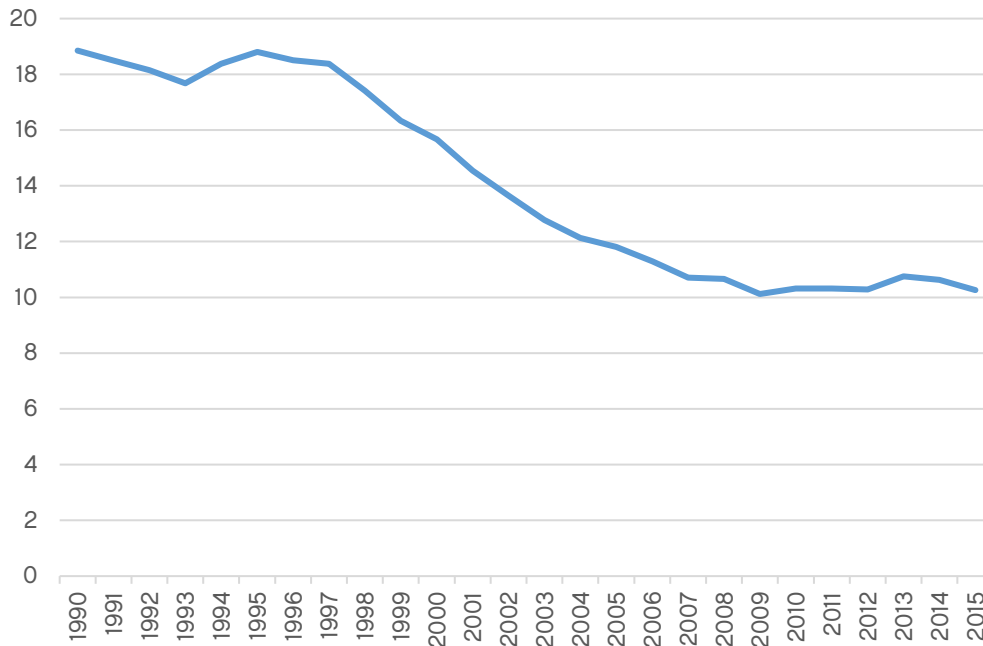
1.1 Relative growth in UK manufacturing: decline

The manufacturing sector has become increasingly marginalised as the UK economy has continued to grow over the last 25 years. Since the late 1990s manufacturing has steadily declined as a proportion of overall national output, as the growth of services has outpaced it.⁴ A change in government policy direction following the 1997 general election ultimately resulted in a long-term significant increase in the share of output derived from finance, real estate and the public sector.⁵ At the start of the period the share of total output contributed by manufacturing had remained relatively stable for several years, however by 2010 its share had shrunk by almost 44% due to the relative boom experienced in other sectors.⁶

⁴ Office for National Statistics, *UK Index of Production: May 2016*
Office for National Statistics, *UK Index of Services: Oct 2016*

⁵ Government Office for Science, *The impact of Government policies on UK manufacturing since 1945*, 2013

⁶ World Bank, *Open Data*, 2016

Figure 2: UK manufacturing as a percentage of GDP

Source: World Bank

1.2 A long term picture of manufacturing

Since 1948 the size of the UK manufacturing sector has increased by 150%.⁷ The largest part of this increase was achieved in the decades following the Second World War, up to 1972, during which output increased by approximately 130%. Progress was slowed during the 1970's due to an economic downturn brought on in part by global supply-side shocks.⁸ The result was a combination of sector-wide growth stagnation, unemployment and high inflation.

During the following decade the manufacturing sector shrunk by 18% and did not begin to recover until 1981, after which output grew rapidly – increasing by 30% in size over the course of the 1980's. Recession struck again during the early years of the 1990s, this time caused in part by high interest rates, falling house prices and an overvalued exchange rate. After shrinking between 1991 and 1992, manufacturing output again recovered, although as the decade progressed the pace of growth slowed. Between 1991 and 2000 the sector grew by only 14% – compared to the 30% increase achieved in the previous decade.

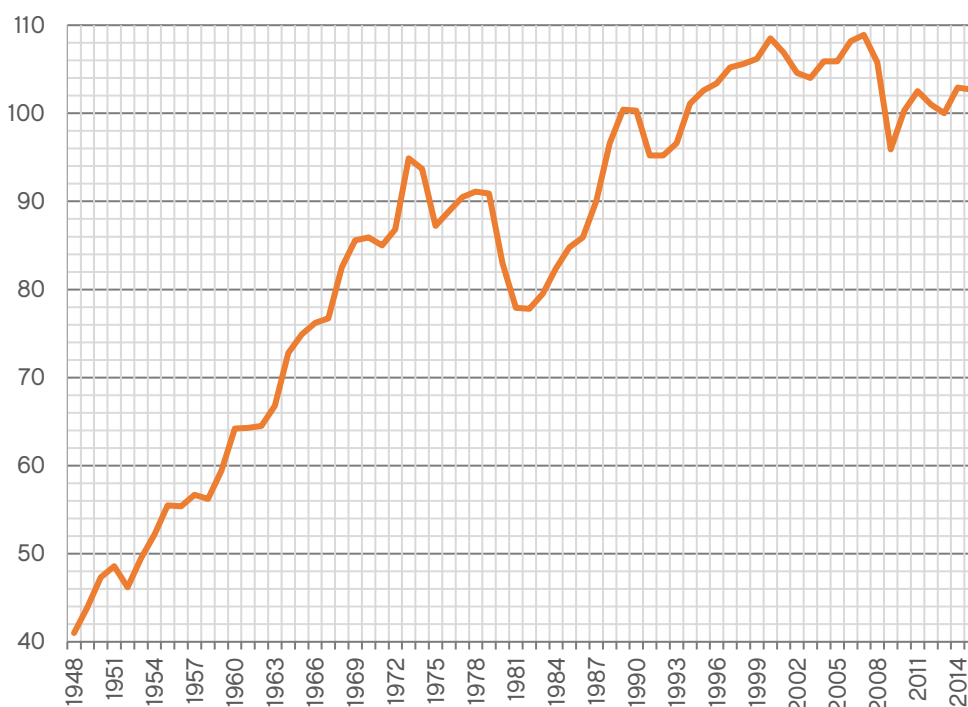
Much of the recovery in the 1980's can be attributed to a boom in the growth rate of Research & Development (R&D) capital (following a major slowdown in the

⁷ Office for National Statistics, *UK Index of Production: May 2016*

⁸ Cameron, *Why Did UK Manufacturing Productivity Growth Slow Down in the 1970s and Speed Up in the 1980s?*, *Economica*, 2003

1970's), and productivity gains derived from decreasing unionisation.⁹ The 1990's however ushered in a new era of perpetual deficit in the international trade of UK manufactured goods – where once the nation had prospered from a surplus. The slowdown of the sector during the decade persisted despite Britain's departure of the Exchange Rate Mechanism (ERM) in 1992, which devalued the overvalued pound and lowered interest rates – both of which government policy had previously kept high, to the detriment of British exports.¹⁰

Figure 3: UK manufacturing growth (2013=100)



Source: Office for National Statistics

1.3 Long-term structural decline in manufacturing growth

The following figures show the annual growth of UK manufacturing since 1950.¹¹

Dividing the period into two,¹² the first sub-period (1950-1982) saw higher annual growth rates on average – 1.85% compared with 0.89% between 1983 and 2015 – this is despite the inclusion of the 1970's in the former period, a decade which saw a significant slowdown in manufacturing growth.

⁹ Cameron, *Why did UK manufacturing productivity growth slow-down in the 1970s and speed up in the 1980s?*, 1999

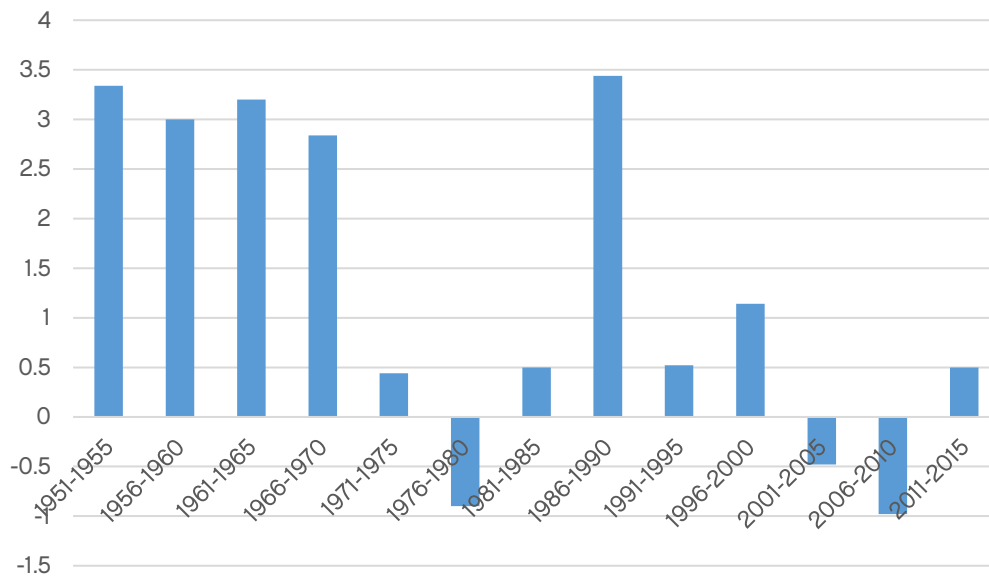
¹⁰ Kitson & Michie, *The Deindustrial Revolution: the rise and fall of UK manufacturing, 1870-2010*, 2014

¹¹ See Appendix for further figures.

¹² See Figure 2A in the Appendix.

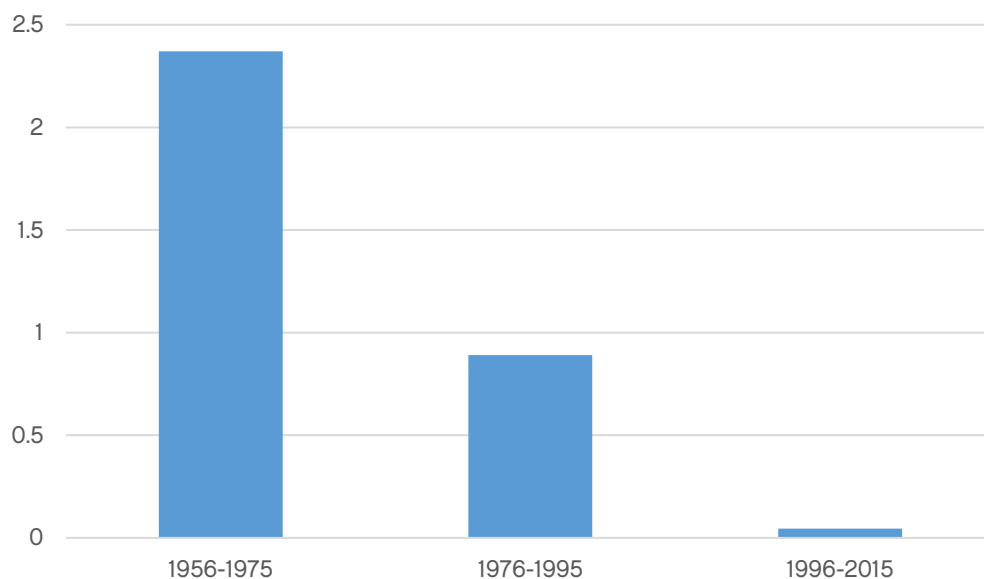
To explore the structural differences across the period further, the annual growth rates have been grouped together in five year (Figure 4), and then 20 year (Figure 5), periods. The resulting graphs suggest a long-term decline in the growth rate of UK manufacturing. This decline is particularly clear in Figure 11 which shows the average annual growth rate of manufacturing fall from 2.37% between 1956 and 1975; to 0.89% between 1976 and 1995; and then to just 0.045% between 1996 and 2015.

Figure 4: UK manufacturing 5-year growth rate



Source: Office for National Statistics

Figure 5: UK manufacturing 20-year growth rate (percent)



Source: Office for National Statistics

The economic downturn that first struck in 2007 – and reached full impact on the manufacturing sector in 2009 – should not be overlooked in this comparison. However economic turmoil, caused in part by supply-side shocks, was also weathered by the manufacturing sector between 1970 and 1985. Indeed, comparing the average annual growth rate achieved in this period with that of the last 15 years again reveals the same decline in annual manufacturing growth – between 1970 and 1985 the average annual growth rate was 0.04%; between 2000 and 2015 the average annual growth rate was -0.16%.

By grouping the annual growth rates of manufacturing over the last 60 years in to three 20-year sub-periods, the long-term loss in momentum of the sector is further emphasised. Between 1956 and 1975 the average annual growth rate of manufacturing output was 2.37%. The sub-period captures the second half of what has come to be considered a post-war “golden age” of growth in Britain and manufacturing, and indeed for Europe and the West in general.¹³ In the following sub-period the average more than halved to 0.89%, due to largescale economic turmoil. However the following sub-period between 1996 and 2015 achieved an annual growth of just 0.05% – 20 times smaller than that achieved in the previous decade.

Finally, and returning to the initial observation, dividing the period in two reveals an era of two halves in which the first sub-period achieved on average twice the growth of manufacture each year than the second. Looking also at the standard deviation of the growth rates in the two sub-periods shows that the first period, between 1950 and 1982 was marked by greater volatility in annual growth rates than the second. Thus it can be concluded that over the last 60 years the growth of British manufacturing has not only persistently weakened but has done so with increasing consistency.

Table 1: UK manufacturing annual growth rate, structural break

	Avg. rate	St. dev.
1950-1982	1.851515	4.409983
1983-2015	0.890909	3.032987

Source: *Office for National Statistics*

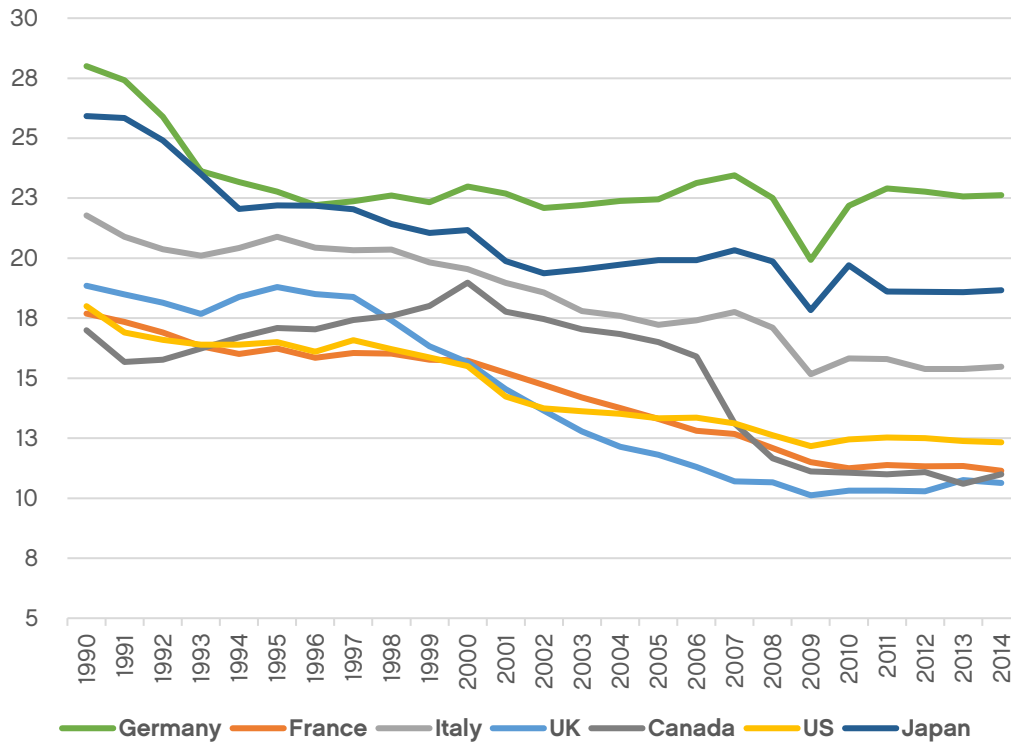
1.4 A cross-country comparison

The relative decline in manufacturing output as a proportion of GDP is not an experience unique to Britain. Manufacturing as a share of total national output has broadly been in decline across all G7 nations. A notable exception is Germany, where manufacturing output as a percentage of overall national output has

¹³ Eichengreen, *The European Economy since 1945: Coordinated Capitalism and Beyond*, 2008

remained stable – fluctuating around 23% since 1993. This stability has been maintained despite the economic downturn which depressed manufacturing output between 2007 and 2011 – and despite Germany being hit hardest. Aside from Germany no other G7 nation has returned to levels achieved in the years before the recession.

Figure 6: UK manufacturing as % of GDP, comparison with G7

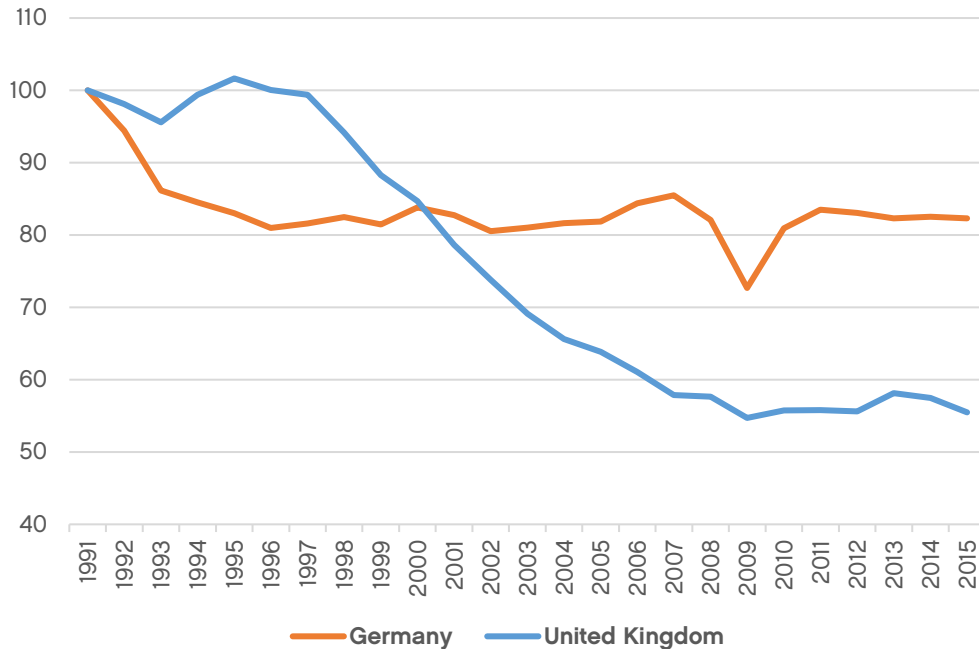


Source: CPS analysis; OECD; World Bank; US Dept of Commerce, Bureau of Economic Analysis; Government of Canada, Statistics Canada

Comparing the trends experienced by the UK and Germany over the last 25 years emphasises the remarkable resilience of the German manufacturing sector. The stability achieved in manufacturing output only since 2009 in the UK is contrasted against that achieved by German manufacturing since the 1990s.

Figure 7: Manufacturing as % of GDP since the 1990's, Germany vs UK

(1991 normalised to base=100 for both countries)



Source: *World Bank*

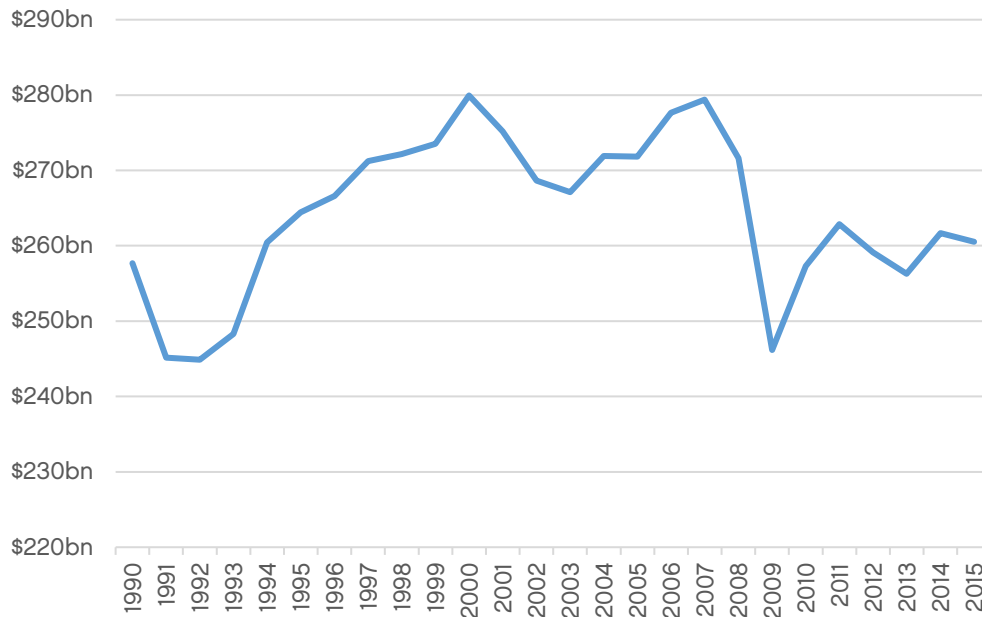
1.5 Real growth in UK manufacturing: stagnation

Looking at output from the manufacturing sector in isolation, rather than relative to other sectors, provides a clear picture of the growth of the sector. Despite initial growth in the early 1990's, manufacturing experienced a slowdown in the years leading up to the 2007 economic downturn. During the recession manufacturing output shrunk back to levels last seen in the 1990's – recovery was finally achieved in 2010, only for output to falter again the following year, and stagnate thereafter. In 2015 the total value of UK manufacturing was \$261 billion – only a 1.1% increase since 1990 and a persistent contraction of 6.8% since the recession.

Where other developed nations have continued to strengthen their manufacturing industry, and less-developed countries have continued to foster their own, the growth of Britain's manufacturing sector has faltered over the last 25 years. This is in part due to Government policy being largely focused elsewhere during the period and the banking and finance sector supported instead.¹⁴

¹⁴ Ibid

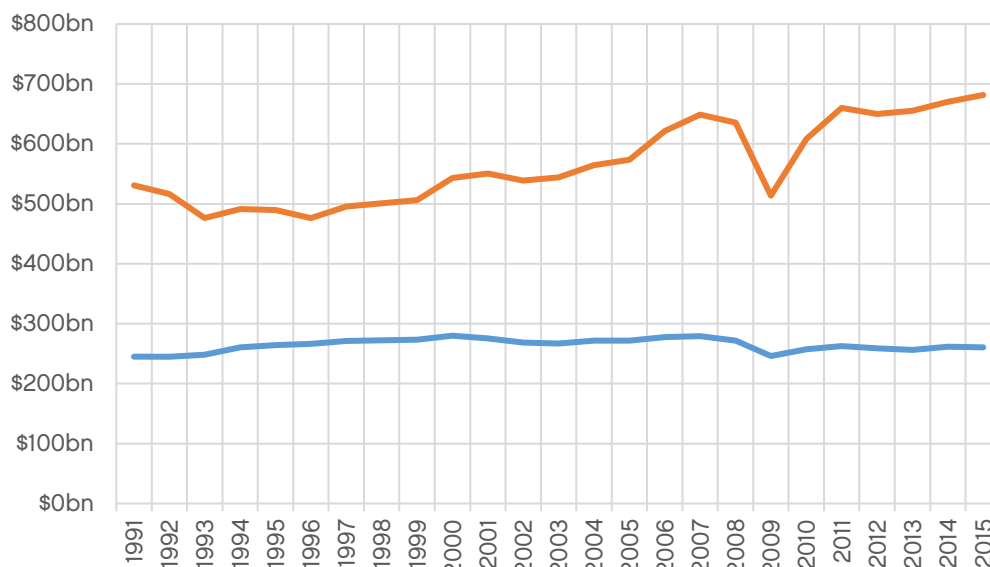
Figure 8: UK total annual Manufacturing, value added (Real 2015 USD)



Source: *World Bank*

When compared to the annual output from German manufacturing, the UK manufacturing sector's long-term stagnation is more pronounced. Since 1991 Germany's manufacturing output has increased by 28.4% and despite shrinking by over 20% during the recession, it rapidly recovered – surpassing its pre-recession peak by 2011.

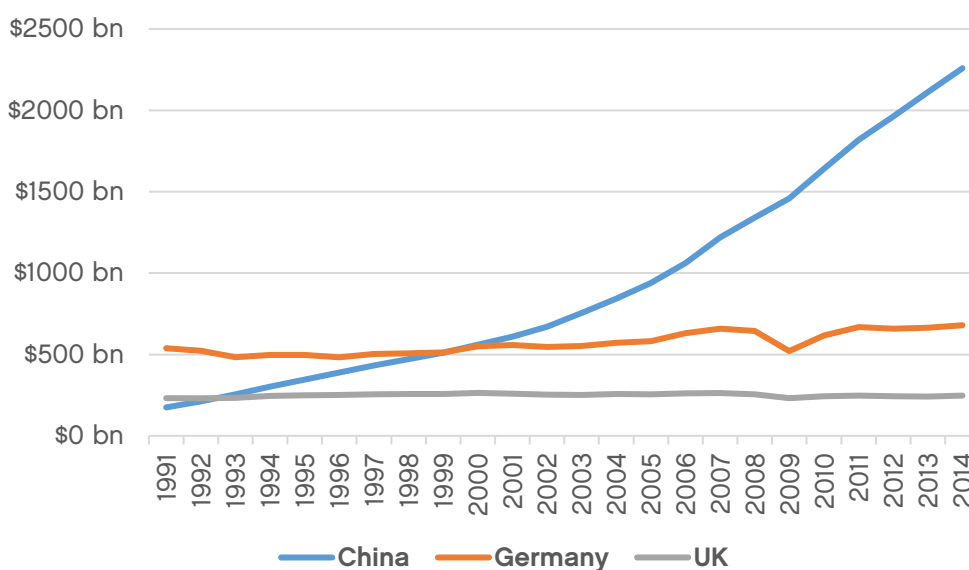
Figure 9: Total annual Manufacturing, value added, UK vs Germany (Real 2015 USD)



Source: *World Bank*

The Chinese Government's decision to radically reform its centrally planned economy in the late 1980's, adopting free market principles and opening to international trade has allowed the country's untapped manufacturing potential to be realised. Despite centuries of dominance, the US and Western Europe (as shown by the comparative performance of the economies of the UK and Germany in Figure 10) have long since fallen behind China in the production and export of manufactured goods.

Figure 10: Total annual Manufacturing, value added (Real 2005 USD) UK vs Germany vs China



Source: *Knoema World Development Indicators*

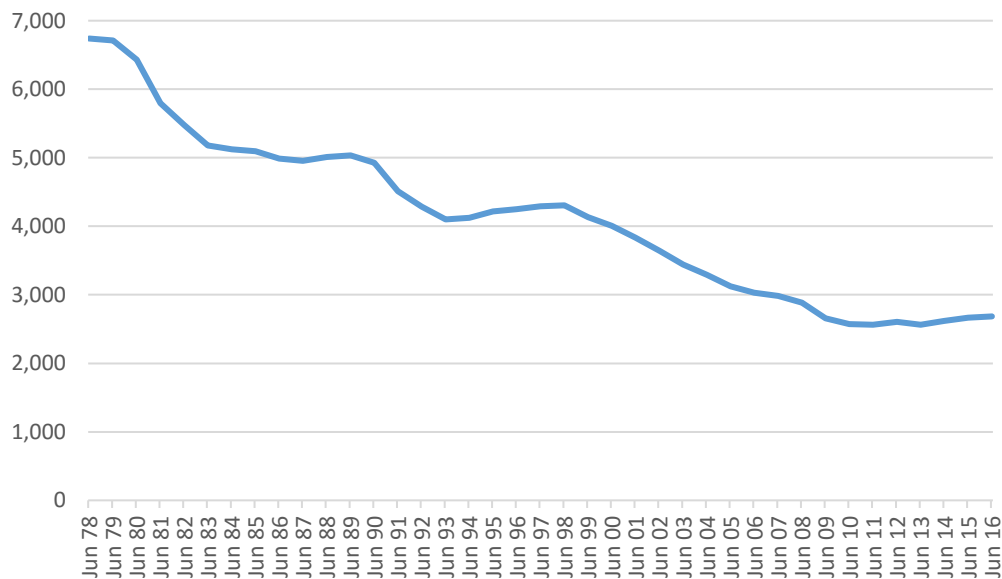
1.6 Employment in Manufacturing

As of June 2016 2.68 million people are employed in manufacturing in the UK.¹⁵ This figure is 0.6% higher than that of one year before – however it is 10% lower than that of 10 years ago, and a full 60% reduction since 1978, when 6.74 million were employed in the sector, and current records begin. This permanent reduction is due in part to the blow levelled on industry by a major economic downturn in the early 1980's, which saw total output from manufacturing shrink by over 14%.¹⁶

¹⁵ Office for National Statistics, *UK Labour Market Statistical Bulletin: September 2016*

¹⁶ Office for National Statistics, *UK Index of Production: May 2016*

Figure 11: number of people employed in manufacturing since 1978 (000's)



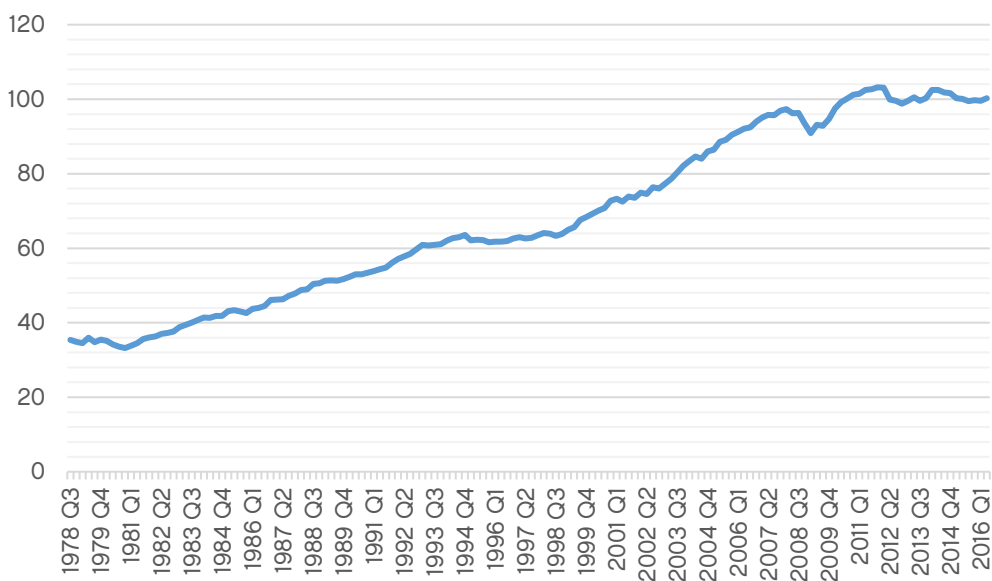
Source: Office for National Statistics.

1.7 Productivity

Productivity has grown strongly in manufacturing over the last several decades (a 180% improvement since 1978), however while it recovered following the 2007 recession, progress has slowed and then stagnated over the last six years. Furthermore, unlike advances made in manufacturing productivity during the first half of the 20th century, gains made in the last 60 years have largely come at the expense of employment. This trend is in part due to British manufacturing becoming increasingly high-tech, requiring greater investment in capital and high-skilled labour, and less low and medium skilled labour.¹⁷

¹⁷ Kitson & Michie, *The Deindustrial Revolution: the rise and fall of UK manufacturing, 1870-2010*, 2014

Figure 12: Productivity in manufacturing, output per worker (2013=100)



Source: Office for National Statistics.

1.8 What does Britain manufacture?

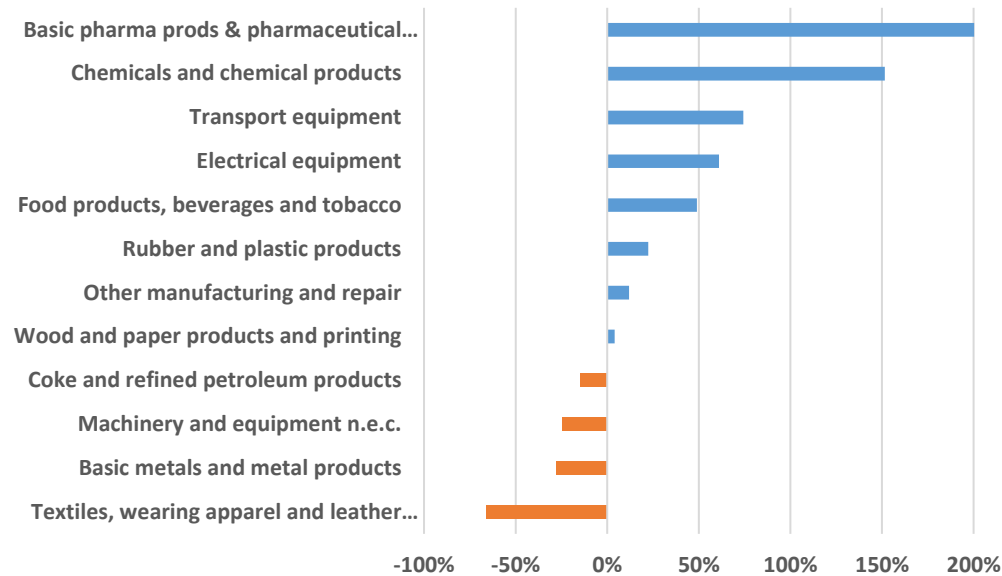
Britain’s most successful manufacturing sectors, in terms of annual growth, have been the pharmaceutical industry, which has tripled in size over the last 45 years; the production of chemicals, which has grown by 150%; and the transport and electrical equipment industries which grew by 74% and 61% respectively during the period. The strong growth of the top three sectors is unsurprising as, despite a general neglect of manufacturing policy over the last 35 years, successive UK Governments have continued to promote long-term industrial support strategies for the pharmaceutical and aerospace industries.¹⁸

Britain’s major losses during the period have come from the textiles industry, which has shrunk to a third of its 1968 size; the production of basic metals and metal products, which has lost 28%; the manufacture of machinery which has lost a quarter; and the coke and refined petroleum products sector which has shrunk by 15%. The loss of Britain’s textile industry is well understood, as the country’s long-held comparative advantage has been lost to developing countries, with larger, lower-skilled labour forces, particularly in South East Asia. The characteristics of textiles manufacturing makes the industry better suited to countries able to mobilise largescale, relatively cheaper, low-skilled labour – a strength that the UK, as a highly developed economy no longer

¹⁸ Ibid

wields.¹⁹ The decline in the manufacture of coke and refined petroleum products is also understandable as the UK's reserves of coal and oil have continued to dwindle, and the international market for fossil fuels has become increasingly dominated by nations with far greater endowments.²⁰

Figure 13: Change (growth/decline) in manufacturing sectors between 1968 and 2015



Source: Office for National Statistics.

1.9 Britain's key manufacturing sectors

Considering the size of the each sub-sector of manufacturing provides useful perspective on the value of their performance. For example, despite the strong growth of the pharmaceutical manufacturing industry, it provides only a fraction (3.5%) of the overall output of the manufacturing sector. In contrast the decline in textiles production is of less concern given that it is the second smallest of manufacturing sectors, comprising just 2.2% of all output.

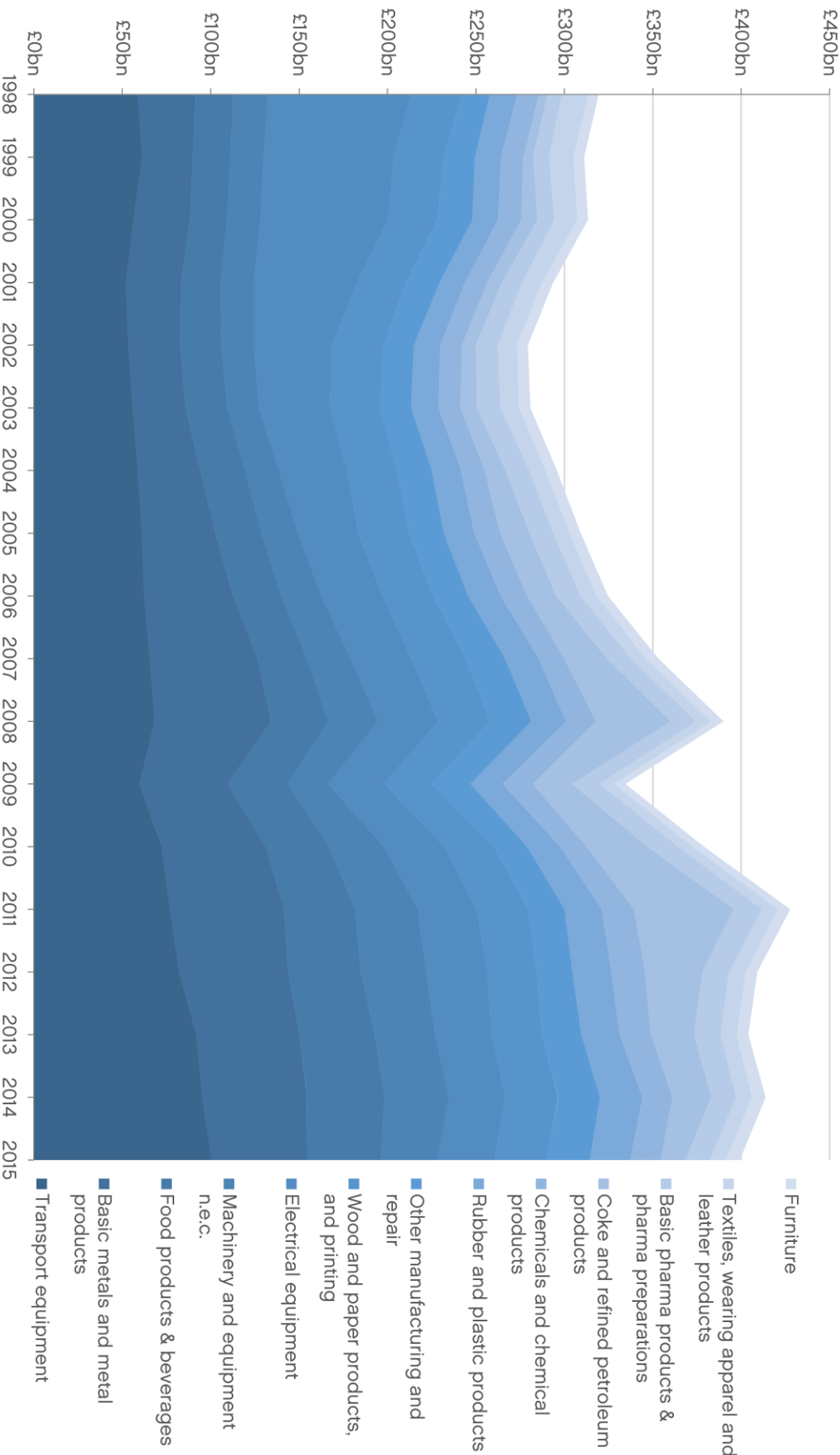
Representing one quarter of all manufacturing output, the production of transport equipment is the largest of the UK's manufacturing industries. That the industry has also achieved the third fastest growth across manufacturing sectors in recent years means that it is easily Britain's most valuable asset among them. Further key sectors are the food and electrical industries which are both large (10% and 7.5%, respectively) and growing steadily.

¹⁹ Keane & Willem te Velde, *The role of textile and clothing industries in growth and development strategies*, 2008

²⁰ Department of Energy & Climate Change, *UK Energy in Brief 2015*

A key area of concern however is the UK's second largest industry, basic metals & metal products, which comprises 13.5% of the manufacturing sector but is in steady decline. The plight of manufacturers of machinery & related equipment should also not be ignored, as the industry represents 8% of all output and yet, as previously noted, has shrunk by a quarter since the late 1960's.

Figure 14: Turnover by manufacturing sector 1998-2015, domestic + exports, real terms (2015 prices)



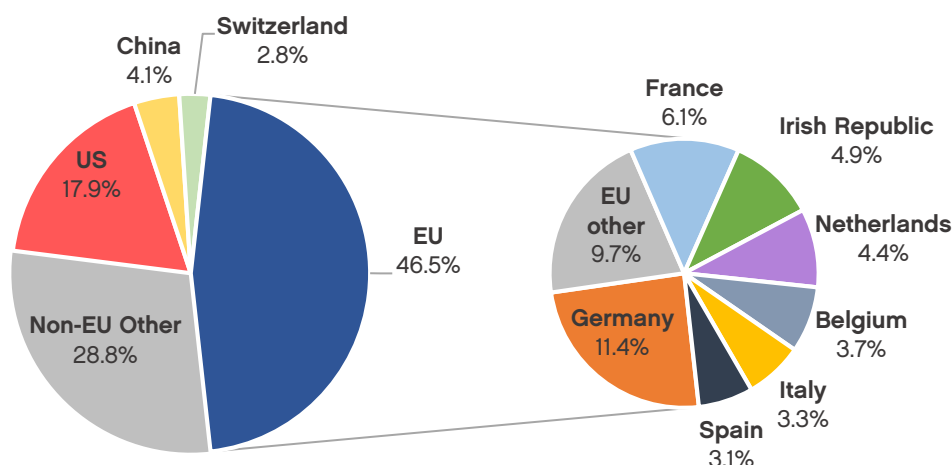
Source: Office for National Statistics, CPS analysis

1.10 UK manufacturing in a global market

In 2015 manufacturing contributed £6.7 trillion to the global economy with Britain ranked as the 11th largest manufacturing nation. As of last year the UK has now broken into the top 10, being ranked as the 9th largest.²¹ This is in part likely due to the increased competitiveness of British exports following the persistent depreciation of the pound since the June referendum on Britain’s continued membership of the European Union.

In 2015 Britain exported two thirds of all the manufactured goods it produced – worth a total of £265 billion, with over 46% of the total destined for EU countries; the top recipients being Germany (11.4%), France (6.1%) and the Republic of Ireland (4.9%). Outside the EU Britain’s top export partners were the US (17.9%; making the country the top overall recipient of British goods), China (4.1%) and Switzerland (2.8%).²²

Figure 15: Top 20 destinations for UK Exports, 2015



Source: UK Trade info.

In addition to being Britain’s largest manufacturing sector, the production of transport equipment yields the largest contribution to the nation’s exports. Approximately half of all manufactured goods from the industry are sold in international markets. Although smaller in volume, the second and third largest manufacturing sub-sectors are even more foreign market orientated, exporting the majority of their production – 83% of the basic metals & metal products and 92% of food products manufactured in the UK are sold abroad.

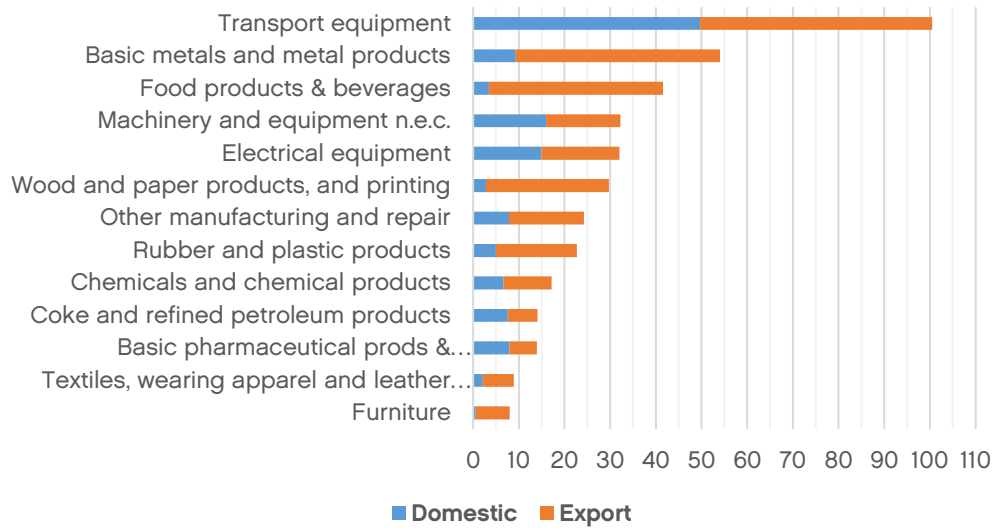
Interestingly, despite the relative growth of the UK’s pharmaceutical manufacturing industry, the sector has the smallest exported proportion of output,

²¹ EEF, UK manufacturing fact card, 2016

²² Office for National Statistics, Turnover in UK production and Great Britain services industries (TOPSI) time series dataset, 2016

with just 43% of manufactured goods leaving Britain. However the economic growth potential of the sector cannot be ignored²³ or indeed the fact that pharmaceuticals contributed 7.8%, or \$35 billion, of the total value of UK exports in 2015.²⁴

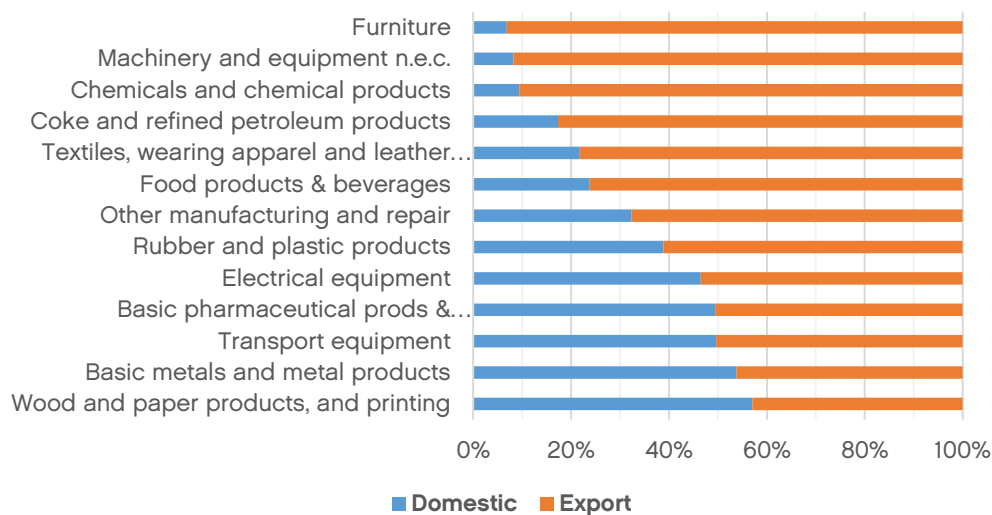
Figure 16: UK 2015 manufacturing turnover by sector, £ billions



Source: Office for National Statistics.

Note: See Appendix for further figures on exports.

Figure 17: UK 2015 manufacturing sectors, ratio of domestic market to export market



Source: Office for National Statistics

²³ Office for Life Sciences, *Strength and Opportunity*, 2015

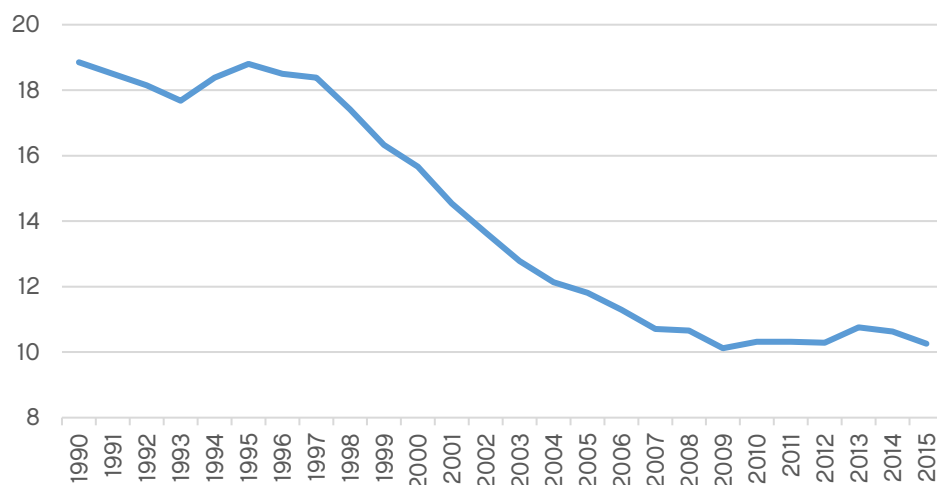
²⁴ The World Factbook, *Country Profiles*, Central Intelligence Agency, 2016

2. IS THERE A NEED FOR UK MANUFACTURING?

2.1 Background

Since 1997, as previously highlighted, there has been a dramatic shift in the economic output patterns of the UK. While manufacturing output has fallen from around 18% of GDP in 1997 to roughly 10% of national output currently (see Figure 1B), financial services have grown by 1.4 percentage points over the same period.²⁵ In fact, in the decade before the financial crisis, the UK financial services sector grew more than twice as fast as the UK economy as a whole.

Figure 18: UK manufacturing as % of GDP



Source: World Bank

²⁵ House of Commons Library, *Manufacturing: statistics and policy*, 2015

The rebalancing of the UK away from manufacturing towards a service orientated economy, as shown in Section 1, raises questions as to whether there is a long-term competitive future for manufacturing over the coming decades. The evidence suggests that there will be a continuing need for UK manufacturing.

2.2 Manufacturing & the Productivity Puzzle

The productivity of the UK economy is estimated to be 16% below pre-crisis levels.²⁶ This lagging of productivity is referred to as the UK's "Productivity Puzzle". A number of factors have been attributed to this trend.

- 1) It is commonly argued that the cost of capital has increased, leading to a falling Capital/Labour (K/L) ratio.²⁷ The K/L ratio is lower in the UK compared to European counterparts. It is reported that the UK has 25 robots per 10,000 employees as opposed to 127 in Germany, 114 in Italy, 57 in Spain and 56 in France.²⁸
- 2) Problems associated with intangible investment (investment that is not physical in nature) account for one third of the productivity puzzle, according to research by UCL.²⁹
- 3) Around one third can also allegedly be explained by weak growth in oil and financial service industry.³⁰
- 4) According to a report by the Federal Reserve Bank of New York, around two thirds can be accounted for by jobseekers focusing on low productivity areas.³¹ This could be highly relevant to the manufacturing argument. Manufacturing has higher productivity than services, but the sector has seen a declining share of employment.

²⁶ Bank of England, *The UK Productivity Puzzle, Quarterly Bulletin*, 2014

²⁷ Centre for Economic Performance, *The UK Productivity and Jobs Puzzle: Does the Answer Lie in Labour Market Flexibility?*, 2013

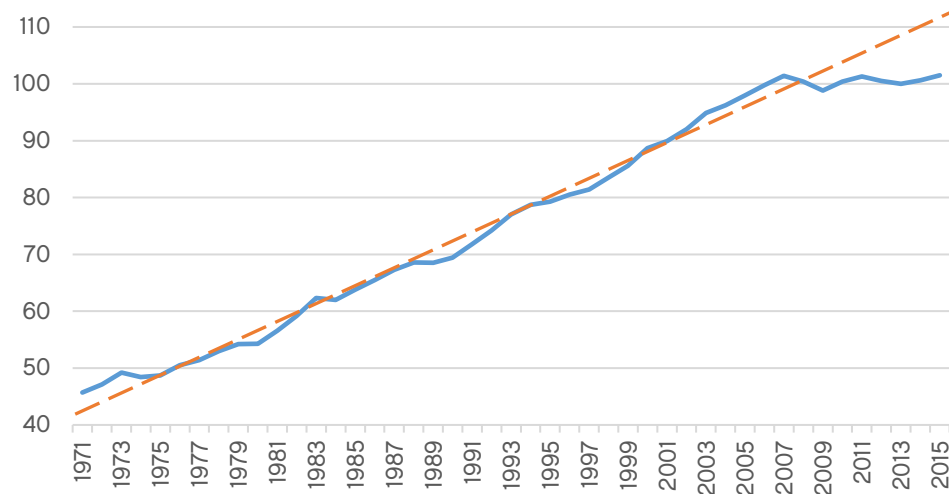
²⁸ The Manufacturer, *The Manufacturer tackles two of UK industry's big issues*, 2013

²⁹ Goodridge, Haskel & Wallis, *Can intangible investment explain the UK productivity puzzle?* 2013

³⁰ Goodridge, Haskel, & Wallis, *The UK productivity puzzle is a TFP puzzle: current data and future predictions*, 2014

³¹ Patterson, Şahin, Aysegul, Topa, & Violante, *Working hard in the wrong place: A mismatch-based explanation to the UK productivity puzzle*, 2016

Figure 19: UK productivity (output per hour, 2013=100) with pre-recession growth forecast



Source: *Office for National Statistics*.

While economists are unsure about the precise causes of the UK’s productivity shortfall, evidence suggests that the manufacturing sector could help redress the UK’s lagging productivity. Manufacturing has seen a 50% increase in labour productivity from the period 1997 – 2007.³² This rate of growth in productivity has drastically outpaced that of services (see Figure 19). It is also estimated that 40% of productivity gains over the next ten years will arise from manufacturing, which is four times the level compared to its current share of national output.³³

As economies mature, manufacturing becomes more important in driving productivity growth, innovation and trade.³⁴ Furthermore, innovation can be spurred via Research and Development (R&D), which disproportionately comes from the manufacturing sector. Manufacturers’ investment in R&D is six times higher than their share of the economy, and investment in innovation leads to the development of new products, processes and services and supports the exploitation of new technologies.³⁵ Some estimates suggest that 70% of R&D in the British economy originates from the manufacturing sector.³⁶

³² EEF, *Manufacturing a solution to the productivity crisis*, 2015

³³ Ibid

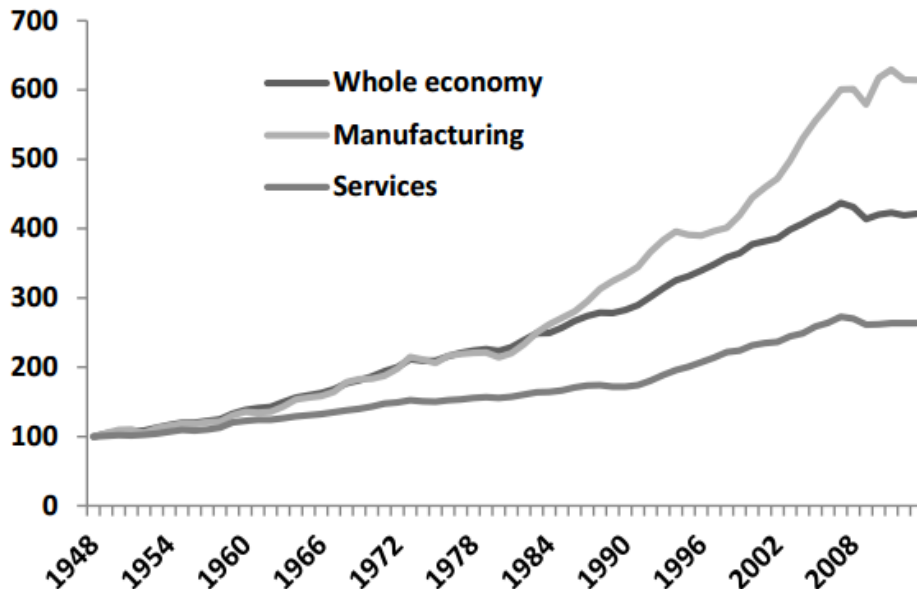
³⁴ McKinsey Global Institute, *Manufacturing the future: The next era of global growth and innovation*, 2012

³⁵ EEF, *Manufacturing a solution to the productivity crisis*, 2015

³⁶ UK Parliament, *Manufacturing: statistics and policy*, 2015

There are also major global manufacturing opportunities in advanced economies, and there are substantial productivity gains to be achieved for firms new to exporting.³⁷

Figure 20: UK productivity sectoral comparison (output per hour, 1948=100)



Source: ONS

Source: EEF.

2.3 The UK performs competitively in numerous areas

Modern Britain excels in a number of manufacturing industries. These include the aerospace, chemicals and pharmaceutical industries,³⁸ the latter two having made the largest contribution to UK productivity.³⁹ The UK aerospace sector in particular is a major economic asset, and is estimated to constitute 15% of the market share in the global aerospace industry.⁴⁰

Furthermore, productivity in vehicle manufacturing is at a record high. Britain built 1.7 million cars in in 2016, which was an 8.5% increase compared to 2015 as well as a 17 year high.⁴¹

³⁷ Harris, and Li, *Export-market dynamics and firm-level productivity: evidence for UK tradable sector*, Industrial and Corporate Chance, Vol. 21, Issue 3, 2011

³⁸ GlaxoSmithKline has recently announced (27 July) a £275 million investment at three of its UK manufacturing sites

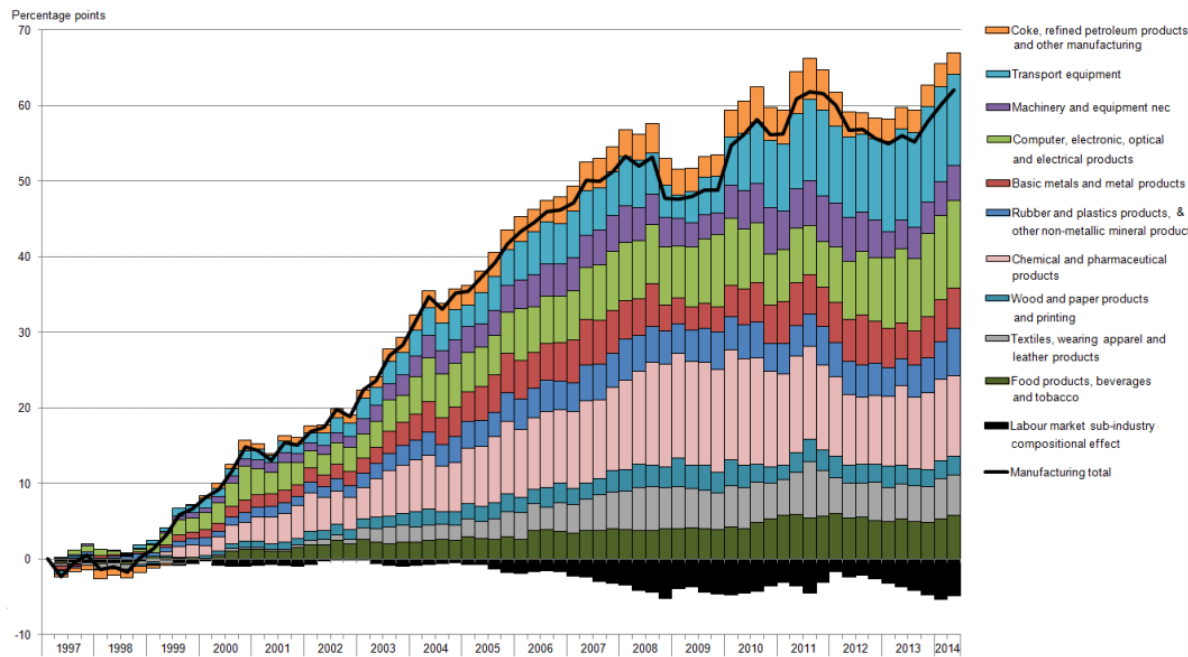
³⁹ Office for National Statistics, *The Changing Shape of UK manufacturing*, 2014

⁴⁰ PWC, *The future of UK manufacturing*, 2009

⁴¹ ITV News, *UK car production hits 17-year high as exports to Europe and US soar*, 2017

Figure 21 depicts the productivity growth of each sector as a contribution to overall productivity in manufacturing. Industries supplying transport equipment, electrical products and pharmaceuticals have all contributed to the substantial productivity growth achieved in the manufacturing sector since 1997.

Figure 21: Contribution to manufacturing sub-industries productivity growth, percentage points since Q1 1997



Source: Office for National Statistics.

2.4 Manufacturing could spur export growth

Despite popular conceptions, the UK is still one of the largest exporters in the world. The UK is the tenth largest exporter of goods and third largest in services. However, there is still room for improvement. The UK has a notable lack of ‘superstar’ exports.⁴² Firms that export 10+ products to 10+ destinations account for 14% of exporting firms in UK against 39% of exporting firms in Germany.

An enhanced manufacturing sector could help boost the UK’s exports. The share of UK exports from manufacturing is up from 30% - 47% (1991 - 2011), which is unprecedented given that manufacturing’s share of the economy has fallen over this period.⁴³

This means that the manufacturing sector could be important in reducing the UK’s current account deficit. The current account deficit is a calculation of a country’s foreign transactions, which includes the UK’s trade balance, and the UK

⁴² Government Office for Science, *What are the constraints on the potential UK exporters?*, 2013

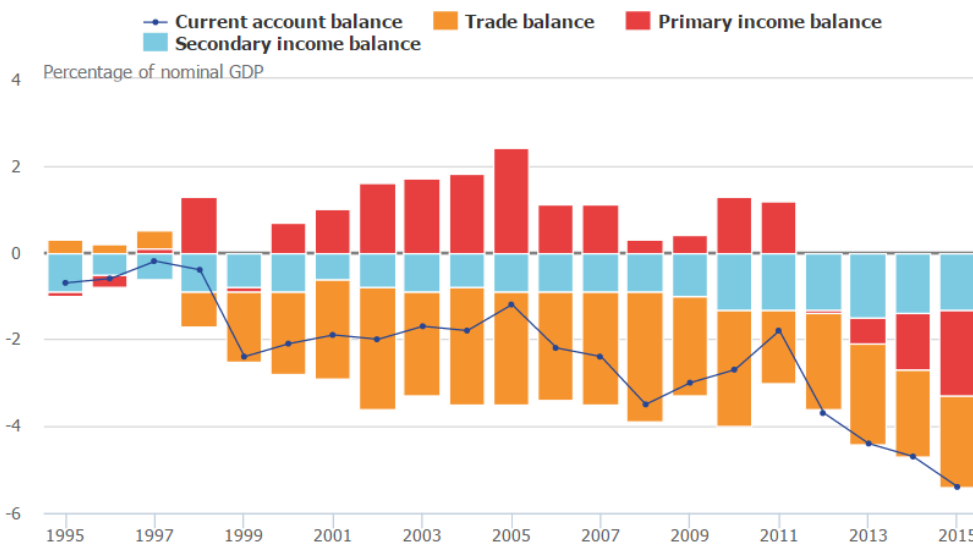
⁴³ Government Office for Science, *What are the constraints on the potential UK exporters?*, 2013

had the largest deficit in the developed world in 2015.⁴⁴ This may reflect⁴⁵ underlying domestic distortions and there is always the risk of a disorderly adjustment that leads to macroeconomic and financial instability.⁴⁶

Given that UK manufacturing is responsible for well over 40% of exports (but just 10% of the economy), manufacturing could help reduce the UK's current account deficit by boosting exports. The trade gap (exports minus imports) accounts for just over 1/3 of the UK's current account deficit (see Figure 22).⁴⁷

The falling value of the Pound Sterling since the Brexit referendum will also give UK manufacturers a greater ability to promote export growth. Since the UK's decision to leave the European Union in June 2016, the Pound Sterling has seen a considerable devaluation, which many economists have argued was well overdue. Prior to the EU referendum, the International Monetary Fund claimed that Sterling was overvalued by between 5 - 20 percent in 2015,⁴⁸ and the former Governor of the Bank of England Mervyn King welcomed the fall in the value of Sterling in October 2016.

Figure 22: UK's growing current account deficit



Source: Office for National Statistics.

⁴⁴ The Telegraph, *Brexit or not, this record deficit is a big, big problem*, 2016

⁴⁵ Blanchard, & Milesi-Ferretti, *(Why) Should Current Account Balances Be Reduced?*, IMF Economic Review, Vol. 60, Issue 1, 2012

⁴⁶ Department for Business, Innovation and Skills, *The risks of international imbalances: beyond current accounts*, (81st annual report).

⁴⁷ City A.M., *Should the UK worry about its record current account deficit?*, 2016

⁴⁸ International Monetary Fund, *IMF Country Report No. 16/168*, 2016

2.5 Opportunities for Reshoring to UK

In the early part of the current decade, the UK experienced an exodus of domestic manufacturing operations to Asia for the purposes of securing lower costs.⁴⁹ However, firms are increasingly looking to ‘reshore’ in Western Europe and the US. It was recently reported, for example, that the number of manufacturing jobs added to the US economy exceeded those moving abroad in 2015.⁵⁰ This is primarily due to the US’ successful shale gas revolution, which has had the effect of driving down energy costs.

The location of manufacturing activity is now often determined by factors other than labour costs, opening up significant opportunities for the reshoring of manufacturing to the UK. The return of some manufacturing to the UK from lower cost locations is partly driven by increasing transportation costs, but also due to concern with quality & production of goods closer to the market.⁵¹

It is also notable that major manufacturing nations such as China will soon experience substantial demographic shifts due to rapidly aging societies. This will lead to labour shortages and could also incentivise the reshoring of manufacturing activities to Western nations.⁵²

2.6 Symbiotic Nature of Manufacturing and Services

There is evidence that over time the distinction between manufacturing and services has become increasingly blurred.⁵³ For example, service-like activities – such as research and development (R&D), marketing and sales, and customer support – now constitute a larger share of manufacturing activity. Furthermore, investment in service industries often has positive spill-over effects into the manufacturing sector. Evidence suggests that a loosening of rules governing Foreign Direct Investment (FDI) in services can have a beneficial impact on the manufacturing sector. For example, the promotion of FDI in services has had the knock on effect of increasing Chile’s manufacturing users’ Total Factor Productivity by 7%. explaining 7% of the increase in Chile’s manufacturing users’ Total Factor Productivity.⁵⁴

It is estimated that around 10% of the UK workforce is employed in manufacturing. However, this of course underestimates the true importance of

⁴⁹ Booth, Special Report: Outsourcing and offshoring, *The Economist*, 2013

⁵⁰ Financial Times, *Reshoring and FDI boost US manufacturing jobs*, 2016

⁵¹ Government Office for Science, *The Competitiveness and evolving geography of British manufacturing: where is manufacturing tied locally and how might this change?*, 2013

⁵² Government Office for Science, *Winning the future markets for UK manufacturing outputs*, 2013

⁵³ McKinsey Global Institute, *Manufacturing the future: The next era of global growth and innovation*, 2012

⁵⁴ World Bank & OECD, *Foreign Direct Investment in Services and Manufacturing Productivity: Evidence for Chile*, 2011

the industry with many jobs in other sectors being dependent upon the supply of goods and services to manufacturing.⁵⁵ And, of course, the manufacturing sector can be vitally important for the provision of public services. This includes the vital relationship between the UK's pharmaceutical sector that provide many treatments for users of the National Health Service.

⁵⁵ Government Office for Science, *What type of workforce will the UK need?*, 2013

3. HOW TO PROMOTE UK MANUFACTURING

3.1 Is the Problem a Lack of Government Intervention?

The Government's current interventions

In January 2017, the Government released a Green Paper on building an industrial strategy in the UK.⁵⁶ This includes areas such as developing skills, upgrading infrastructure, encouraging trade and investment and delivering affordable energy. It should be emphasised, however, that successive UK Governments have made a number of economic interventions into the UK economy, including into the manufacturing sector. Former and current administrations have seen value in using the Government to facilitate the growth of the manufacturing sector. For example, 20 manufacturing supply chain projects across the UK were given £67 million of government investment in 2015.⁵⁷

The Government has various schemes that assist the UK's manufacturing sector.⁵⁸ These include:⁵⁹

- 1) Catapult Centres designed to enable companies to access equipment, expertise and information needed to develop and commercialise ideas and innovations.

⁵⁶ HM Government, *Building our industrial strategy*, January 2017

⁵⁷ Department for Business, Innovation & Skills, *Manufacturers get more support from government*, 2015

⁵⁸ House of Commons Library, *Manufacturing: statistics and policy*, 2015

⁵⁹ See Appendix B *How has the Government tried to promote manufacturing?*

- 2) The Advanced Manufacturing Supply Chain Initiative, worth £125 million, which is to be awarded to firms or groups of firms in the UK in order to help expand already operating suppliers and to encourage the development new suppliers.
- 3) A Manufacturing Advisory Service to offer manufacturing firms professional advice and expert support.

Is an industrial strategy the way forward?

In 2013, the former Department of Business, Innovation and Skills (BIS) suggested that interventions will be more targeted on specific sectors and the production process.⁶⁰ This may have merit in certain circumstances. Although the UK Government does make some limited interventions into the market, it would, however, be ill advised to significantly expand government support and intervention in the manufacturing sector. A Government report into the impact of industrial policy for the UK's manufacturing sector suggests that aggressive industrial strategies have not been helpful for the sector.⁶¹ Industrial subsidies are described as “an almost unmitigated failure” and the paper argues that attempts to create national champions is rarely successful.

However, there are areas where interventions can be warranted. These include:

- 1) Where Government purchasing is intrinsic to the market. This is particularly the case in the relationship between the UK's thriving pharmaceutical industry and the NHS.
- 2) The promotion of foreign direct investment and trade opportunities can raise the level of manufacturing activity in the UK, and implementing supply side measures can help boost competitiveness
- 3) In education and training, where there has been persistent concern over the poor provision of vocational training, particularly in comparison with Germany. This can be seen as resulting in an under-investment in just the kind of intermediate level skills which are highly valued in manufacturing, and which are likely to be under-supplied by the market.
- 4) Facilitating manufacturing activity by, for example, providing services which offer firms advice on potential export markets. In the UK, the Manufacturing Advice Service helps firms bring new products to market and develop supply chains.

⁶⁰ Department for Business, Innovations & Skills, *The future of manufacturing: a new era of challenge and opportunity for the UK*, 2013

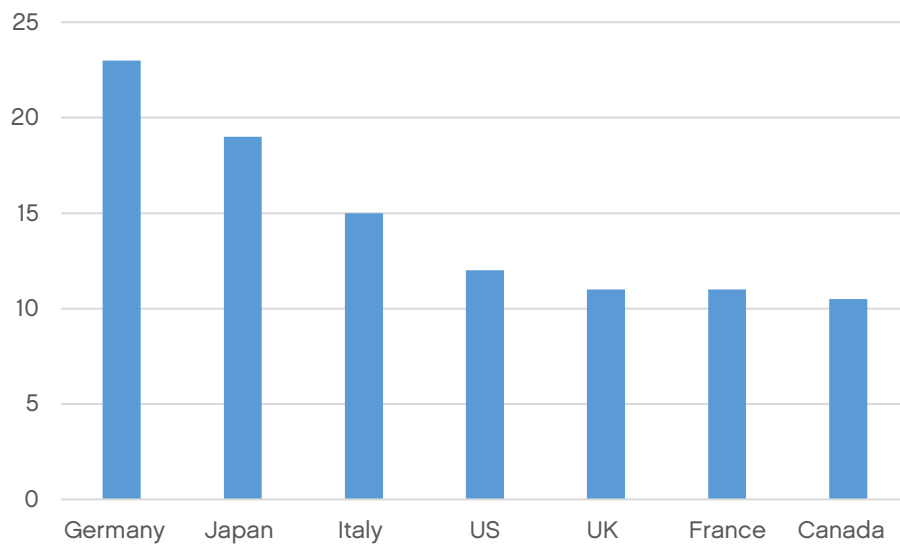
⁶¹ Government Office for Science, *The impact of government policies on UK manufacturing since 1945*, 2013

3.2 Manufacturing in Germany

Germany is currently Europe’s leading exporter of manufactured goods, with the sector accounting for over 20% of the German economy. German manufacturing industry is underwritten by a number of important economic relationships, with a higher degree of state involvement compared to the UK.

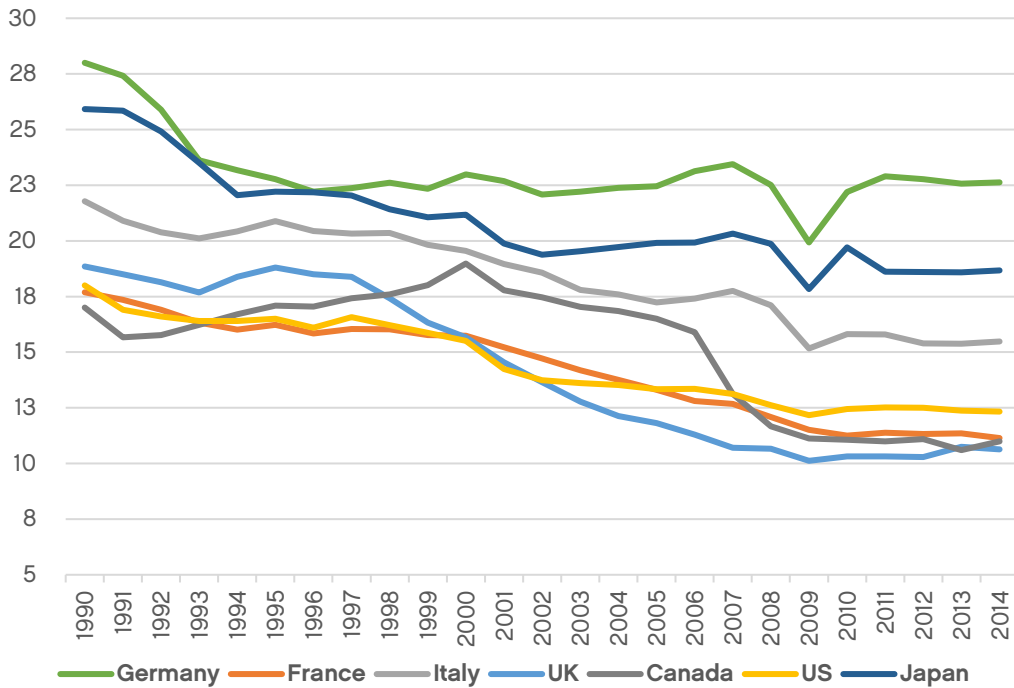
Intra-sectoral networks of companies, trade unions, banks and technical institutions play a leading role in co-ordinating economic activity in Germany. Furthermore, the Fraunhofer Society is a network of government-backed research institutes that provide research in a variety of fields. The Government contributes around two thirds of the budget.

Table 2: Manufacturing as a percentage of overall economy



Sources: *World Bank* and *Canadian Government*

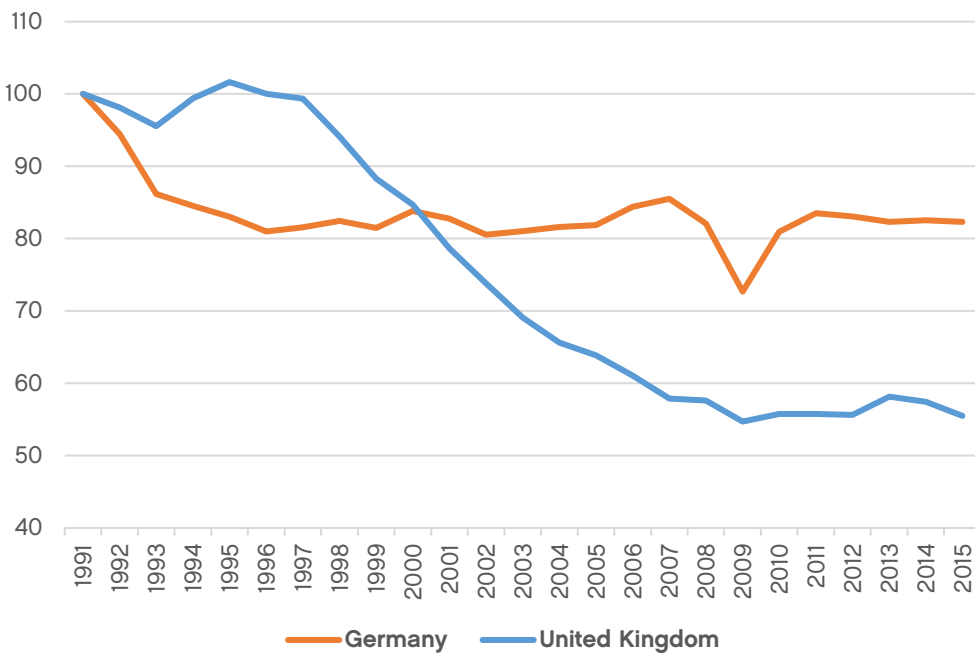
Figure 6: UK manufacturing as % of GDP, comparison with G7



Source: CPS analysis; OECD; World Bank; US Dept of Commerce, Bureau of Economic Analysis; Government of Canada, Statistics Canada

Figure 7: Manufacturing as % of GDP since the 1990's, Germany vs UK

(1991 normalised to base=100 for both countries)



Source: World Bank

Can the UK learn lessons from the German manufacturing industry?

Yes

In the German education system there are established routes for students in upper secondary school to enter into apprenticeships or vocational training, and routes are held in high social regard. This system ensures that there is a substantial source of highly-skilled workers. Around 100,000 new engineers and scientists replenish the job market every year in Germany.⁶² This could be an example that the UK may seek to emulate to boost skill levels among the population.

No

The institutional framework in Germany is either absent or underdeveloped in the UK. Institutional reform in the UK would need to work with, rather than against, the grain of an economic system that is primarily co-ordinated through markets.⁶³ It is also notable that Germany's membership of the Euro helps its manufacturing exporters. In 2014, the International Monetary Fund claimed that Germany's inflation adjusted exchange rate was undervalued by 5-15%.⁶⁴

There are also specific areas where the UK will not want to follow in Germany's footsteps, particularly in the area of energy costs. Germany's energy and CO2 emission policies are a key concern for industry.⁶⁵ Although some costs for industry are mitigated, domestic consumers have ended up shouldering the burden of green taxes and now pay the second highest power prices in Europe (behind Denmark). This policy is a concern for both industry and domestic households in Germany. The chemical group BASF has announced plans to shift the bulk of its investment outside Europe, partly because of higher energy costs.⁶⁶

⁶² Zhang, *The Secrets of Germany's economic success*, Deutsche Welle, 2013

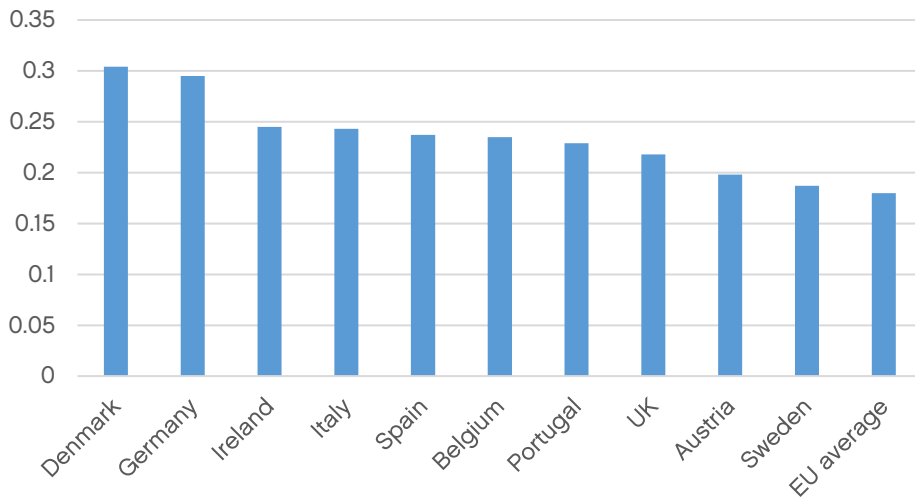
⁶³ Government Office for Science, *The German manufacturing sector unpacked: institutions, policies and future trajectories*, 2013

⁶⁴ Lachman, *Germany should leave the euro*, American Enterprise Institute, 2016

⁶⁵ World Economic Forum; CEO Policy Recommendations for Developed Economy Nations, *The Future of Manufacturing*, 2012

⁶⁶ Financial Times, *Clean energy proves a costly exercise for Germany*, 2014

Figure 23: German households pay the second highest electricity prices in the EU (2015, figures in Euros per kWh)

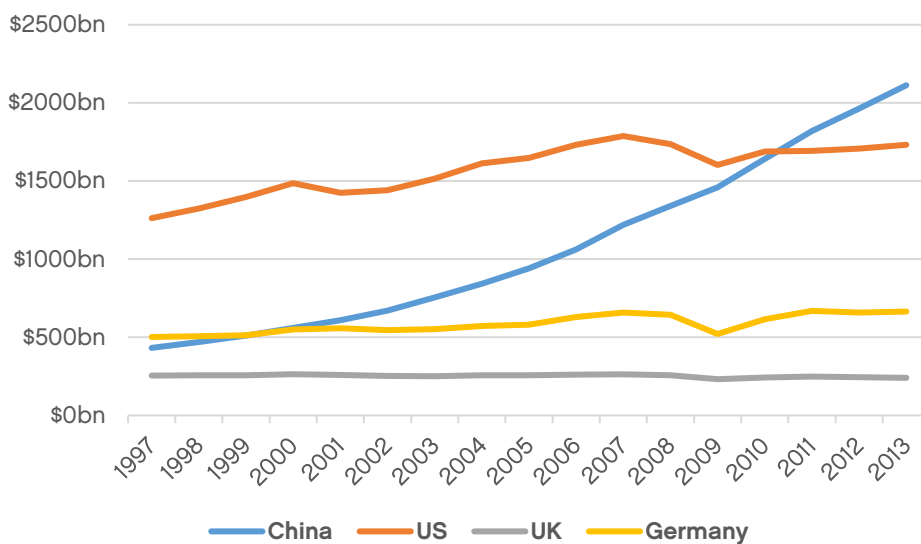


Source: *European Union*

3.3 Manufacturing in the US

The world leader in the production of manufactured goods since the late 19th century, the US has experienced, as with other highly developed nations, long term decline in its manufacturing output as a proportion of its GDP. As of 2010, the US has now been surpassed by China in total annual manufacturing output.⁶⁷

Figure 24: Manufacturing output, value added (Real, 2005 USD)



Source: *Knoema World Development Indicators*.

⁶⁷ Executive Office of the President; President's Council of Advisors on Science and Technology, *Report to the President on Ensuring American Leadership in Advanced Manufacturing*, 2011

Manufacturing however has continued to be a mainstay of economic activity and recent US Government Administrations have made clear a commitment to promoting and protecting manufacturing as a means to economic growth. In particular following the findings of a 2011 Government report, *Report to the President Ensuring American Leadership in Advanced Manufacturing*,⁶⁸ resolve to support manufacturing was formerly established.

The report concluded that the US was losing leadership in manufacturing, particularly in the production of high-tech products, including those resulting from home-grown innovation and inventions, and in manufacturing-associated R&D. The report also claimed that the US was lagging behind competitor nations in providing the business environment and skilled workforce needed for advanced manufacturing.

The resulting strategic plan for supporting the US manufacturing sector followed by the Obama Administration focused on promoting innovation; skills; improving the business climate; energy policy; private, public and academic investment, particularly into R&D for advanced manufacturing technologies; and encouraging employment repatriation – in particular with the use of tax credits.⁶⁹

Can the UK learn lessons from the US manufacturing industry?

Yes

In recent years the US has enjoyed relatively high levels of FDI in its manufacturing sector – an objective government policy has sought to encourage. At the Federal level the Select USA initiative was launched by the Obama Administration in 2011 to “showcase the United States as the world’s premier business location and to provide easy access to federal-level programmes and services related to business investment”.⁷⁰ Housed within the US Department of Commerce, the initiative claims to have so far facilitated more than \$23 billion in overseas investment⁷¹ and suggests a relatively successful strategy that the UK could learn lessons from.

The successful extraction of natural gas from shale in the US has also dramatically lowered the domestic price of energy. Electricity costs for industry have effectively plateaued⁷² since 2010, while natural gas prices have collapsed from a peak of over \$12 per MBtu to around \$2.5 per MBtu in 2016.⁷³ This, along with increasing wages in low-cost countries, has helped the US attract many manufacturing firms back to the US. It was recently reported that the number of manufacturing jobs added to the US economy in 2015 exceeded those moving

⁶⁸ Ibid

⁶⁹ EY, *Advanced Energy Manufacturing Tax Credit*, 2012

⁷⁰ SelectUSA, *About SelectUSA*, 2016

⁷¹ Ibid

⁷² US Energy Information Administration, *Electric Power Monthly*, 2016

⁷³ US Energy Information Administration, *Natural Gas*, 2016

abroad.⁷⁴ The UK's manufacturing base would similarly benefit from policies that promote lower electricity costs for industry.

No

The new US President's pronouncements on trade policy would not be appropriate for the UK's manufacturing sector, or the UK's economy more broadly. Particularly in the post-Brexit era, it is vital that the UK seeks to push for the greatest access possible to the European Single Market and also promote new bilateral trading relationships with non-EU countries.

⁷⁴ Financial Times, *Reshoring and FDI boost US manufacturing jobs*, 2016

4. PROBLEMS FACING UK MANUFACTURING

As stated in the previous section, encouraging FDI into certain manufacturing sectors can help boost growth and productivity. However, this alone cannot provide a successful strategy. Appropriate supply side supports are necessary to ensure the greatest possible welfare and productivity gains.⁷⁵ It is therefore important to scrutinise whether supply-side policy in the UK is promoting the manufacturing sector.

4.1 Problem of Skills Shortages

Even though employment in manufacturing is expected to fall by 170,000 by 2020, many manufacturing job vacancies will need to be filled due to the workforce aging. It is estimated that 800,000 manufacturing jobs will need to be filled by 2020.⁷⁶

There are already major skill shortages.⁷⁷ Three quarters of companies struggle to recruit, with two thirds citing a lack of technical skills among applicants. This shortage is reflected globally. The global supply of high-skill workers is struggling to keep up with demand, according to Mckinsey Global Institute.⁷⁸

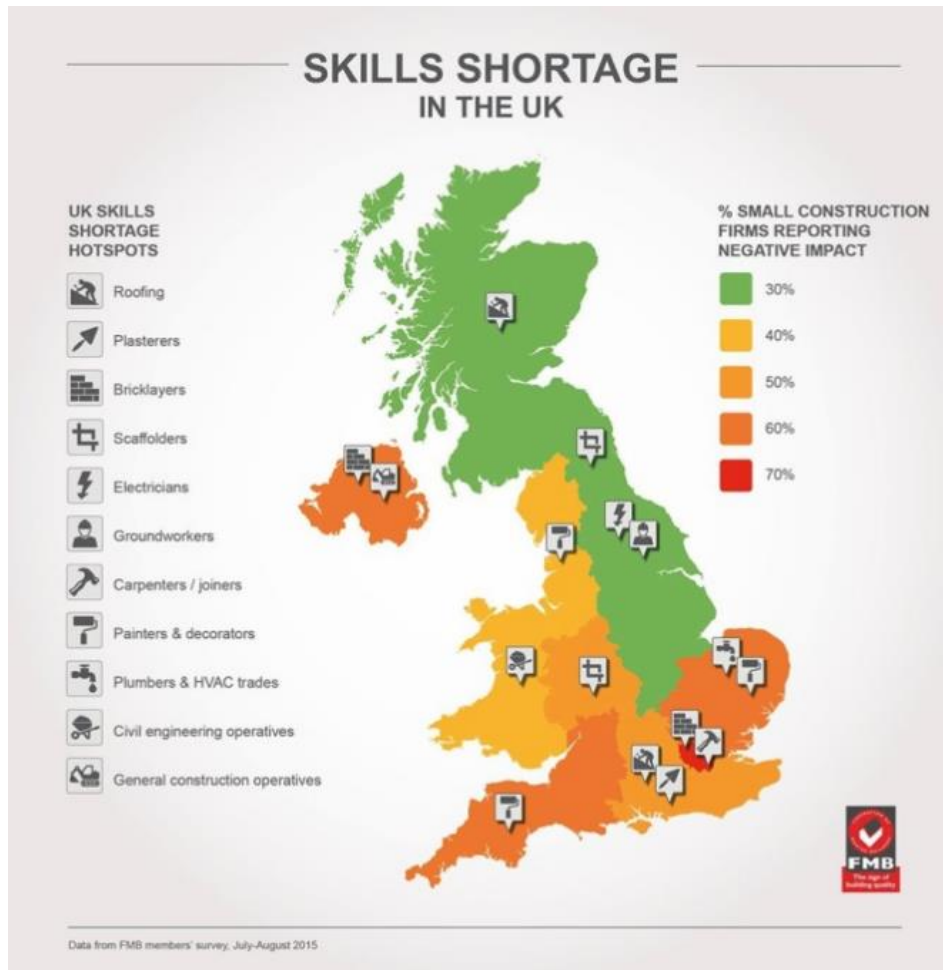
Figure 25: Construction Skills Shortage across the UK

⁷⁵ The World Bank, *Can open service sector FDI policy enhance manufacturing productivity? Evidence from Indonesia*, 2013

⁷⁶ Government Office for Science, *What type of workforce will the UK need?*, 2013

⁷⁷ The Guardian, *Most UK manufacturers are struggling to recruit skilled workers – report*, 2016

⁷⁸ McKinsey Global Institute, *Manufacturing the future: The next era of global growth and innovation*, 2012



Source: *Ace Training*.

Manufacturing firms are facing skill shortages,⁷⁹ particularly in the engineering and science areas that are central to manufacturing. In the UK it was estimated that the manufacturing industry needed to recruit and train 82,000 engineers, scientists and technicians across the country by 2016.⁸⁰ This has led to calls for there to be improvements in the UK's education system focusing on skills associated with the manufacturing system.⁸¹

Issues associated with the education system

Compared to an OECD average of 44 per cent, only 37 per cent of UK adults finish education at a level equivalent to A Level.⁸² This leaves many young people lacking basic skills. The problem is then compounded by an apprenticeship programme that does not appear fit for purpose. Data from the House of

⁷⁹ Engineering the Future, *An Insight into Modern Manufacturing*, 2014

⁸⁰ The Manufacturer, *The Manufacturer tackles two of UK industry's big issues*, 2013

⁸¹ Chryssolouris, Mavrikios, & Mourtzis, *Manufacturing Systems: Skills & Competencies for the Future*, *Procedia CIRP*, Vol. 7, 2013

⁸² UK Commission for Employment and Skills, *The Labour Market Story: The State of UK Skills*, 2014

Commons Library confirms the lack of progress in boosting apprenticeships in non-service sectors of the economy.⁸³ Engineering and manufacturing apprenticeships increased by just 23,000 over three years, whereas apprenticeships in business, administration and law grew by 83,000.

4.2 Issues associated with Infrastructure

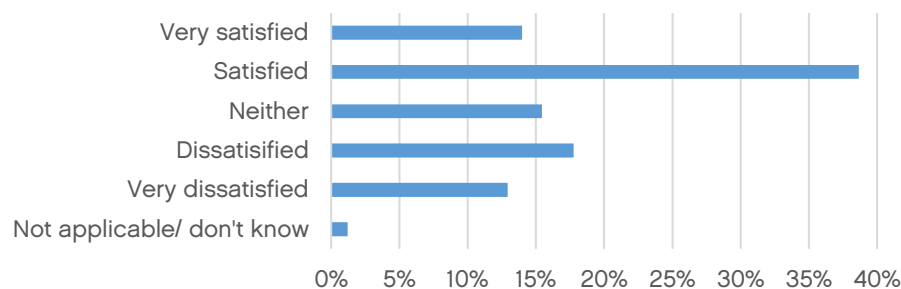
Electricity supply

The reliability of electricity supply is judged⁸⁴ to be one of the most crucial components for competitive manufacturing, and the potential shortfall in UK energy supplies has been identified as a reason for concern for manufacturing.⁸⁵ National Grid's latest review suggests that energy supply margins are narrow.⁸⁶ Without emergency supply and demand side measures, de-rated capacity margins for the winter of 2016/17 would have just been 1.1%. The capacity crunch is being caused by the closure of baseload coal fired power plants, much of which is due to EU emissions legislation. There are also major issues with the cost of electricity (see section "issues associated with environmental legislation" below).

Telecoms

The density of telecom networks is also a critical component for competitive manufacturing.⁸⁷ However, in the UK, it is estimated that in rural areas over half of broadband users are unable to achieve the modest speed of 6.3 Mbits/sec.⁸⁸ Furthermore, an IoD survey suggests that around 30% of SMEs are either dissatisfied or very dissatisfied with their internet connection (see Figure 26).

Figure 26: Speed satisfaction of workplace internet



Source: *Institute of Directors*.

Airport capacity

⁸³ House of Commons Library, *Apprenticeship statistics for England, 2016*

⁸⁴ Government Office for Science, *The future role of energy in manufacturing, 2013*

⁸⁵ Engineering the Future, *An Insight into Modern Manufacturing, 2014*

⁸⁶ National Grid, *Winter Outlook Report 2016/17, 2016*

⁸⁷ OECD, *The role of services for competitiveness in manufacturing, 2013*

⁸⁸ Farrington, Philip, Cottrill, Abbott, Blank & Dutton, *Two-Speed Britain: Rural Internet Use, 2015*

Analysis conducted by the UK Government suggests that a number of manufacturing firms have been attracted to the area around Heathrow due to its networking services.⁸⁹ This highlights the importance of a hub airport to the manufacturing sector for activities such as freight movement. However, there are concerns that London could lose its international hub status if more is not done to expand the freight capacity and facilities at Heathrow airport.⁹⁰

Air freight tonnage at the London airports has grown over the last 20 years. However, this disguises a worrying trend. The market grew rapidly until 2000, but since that time it has largely stagnated. This stagnation has coincided with growing capacity constraints at Heathrow and the inability of the London hub to grow in terms of Air Transport Movements, according to Transport for London.⁹¹

FACT: 2.1 million tonnes of freight – equivalent to half of all freight demand in 2050 – will have to be trucked away from London airports if there's no airport expansion.⁹²

Ports

Ports are already a vital strategic asset for the UK economy, accounting for 96% of all trade volume and three quarters of trade value.⁹³ The UK's ports are comparatively very efficient. Three quarters of the UK's largest ports are privatised, which is in contrast to the 80% of EU ports that are operated by State or Local Authorities.⁹⁴

Seaports are a vital resource for the UK's manufacturing base, and the Government will need to examine ways of allowing UK seaports to thrive.

4.3 Issues associated with environmental legislation

The literature on environmental regulation (not related to energy costs) suggests that the impact of such policy is disputed. There is no evidence of a positive impact of environmental regulation on the research and development or total capital accumulation of manufacturing firms.⁹⁵ But some studies do suggest that environmental regulation is not a constraint on current business in the UK.⁹⁶

⁸⁹ Government Office for Science, *Infrastructure and manufacturing: their evolving relationship*, 2013

⁹⁰ Allport Cargo Services, *Heathrow cargo facilities need expanding, says freight industry*, 2013

⁹¹ York Aviation, *Implications for the Air Freight Sector of Different Airport Capacity Options*, 2015

⁹² Ibid

⁹³ Centre for Policy Studies, *The Free Ports Opportunity*, 2016

⁹⁴ Centre for Policy Studies, *European Commission proposals threaten UK Ports industry*, 2016

⁹⁵ Kneller, Richard, and Manderson, Edward, *Environmental regulations and innovation activity in UK manufacturing industries*, Resource and Energy Economics, Vol. 34, Issue 2, 2012

⁹⁶ Engineering the Future, *An Insight into Modern Manufacturing*, 2014

There is, however, strong evidence to suggest that environmental policy targeted at energy costs is having an impact on UK manufacturers. A study by the London School of Economics suggests that the following areas are vulnerable to a carbon price of £20 per tonne:⁹⁷

- Manufacture of coke and refined petroleum products (SIC 19)
- Mining of coal and lignite (SIC 05)
- Manufacture of iron and steel (SIC 24.1-24.3)
- Manufacture of dyestuffs and agro-chemicals (SIC 20C)
- Cement (SIC 23.5)
- Other metals (SIC 24.5)

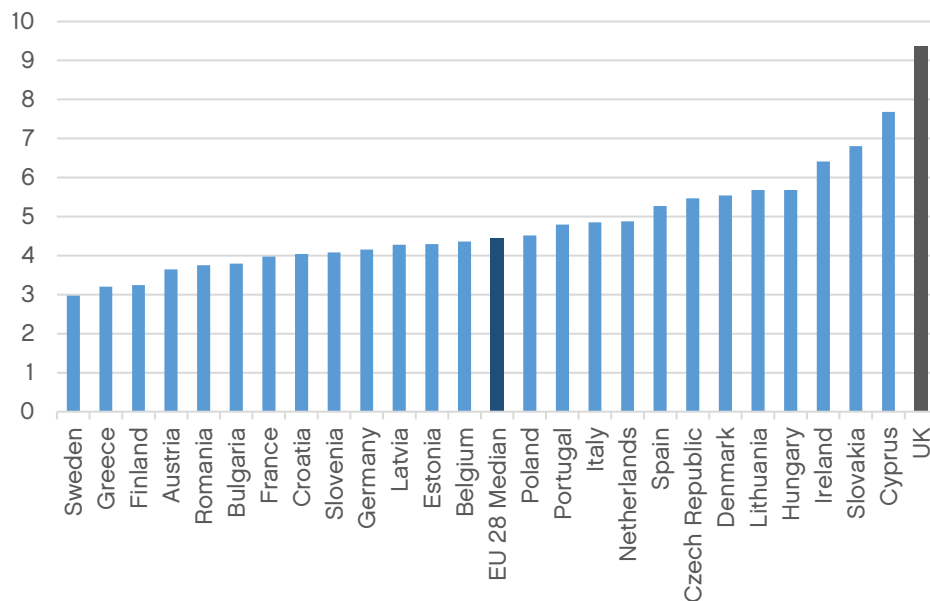
In addition to the list above, production sectors such as fertilisers, chemicals and ceramics are also vulnerable to competitive pressures under these criteria.

Furthermore, energy and electricity costs matter a great deal, according to the Renewable Energy Foundation's John Constable.⁹⁸ They cite analysis published by the Department for Energy & Climate Change (DECC) that suggests electricity prices are 26% higher for energy intensive users due to policies. And the cost of energy policies is scheduled to rise sharply by 2020. Electricity prices are also an issue for non-energy intensive industries. Medium sized businesses would see prices 77% higher than they would be in the absence of policies by 2020.

⁹⁷ Grover, Shreedhar, & Cenghelis, *The competitiveness impact of a UK carbon price: what do the data say?*, 2016

⁹⁸ Global Warming Policy Foundation, *Climate Policies and the Future of Manufacturing*, 2016

Figure 27: EU member state electricity prices for large industrial users (p/kWh, Jan-Jun 2015)



Source: *Eurostat and EEF*

4.4 Regulatory Compliance

Like many sectors, the manufacturing industry is facing increasing pressure from compliance and regulatory bodies.⁹⁹ These include the introduction of new regulations such as UDI (Universal Device Identification), ePedigree requirements and restriction on the production of chemicals – all which must be adhered to in order to continue trading. Keeping abreast of regulations and managing compliance reporting is an ongoing challenge faced by the sector, and more companies are choosing to dedicate whole teams to stay ahead of new rules. There is, however, little evidence to suggest that manufacturers are detrimentally affected by current general rules and regulations.¹⁰⁰

4.5 Problems with Access to Finance

Access to finance is a problem for SMEs more broadly. Innovative firms, in particular, are more likely to be rejected for finance, meaning that access to credit may therefore be restricting growth.¹⁰¹

Limited access to finance for small manufacturers appears to be an issue. Manufacturers are now 28% less likely to use external finance compared with two years ago.¹⁰² According to the SME Finance Monitor, the number of

⁹⁹ Global Manufacturing, *6 challenges facing the global manufacturing sector in 2015*, 2014

¹⁰⁰ Engineering the Future, *An Insight into Modern Manufacturing*, 2014

¹⁰¹ Lee, Sameen, & Cowling, *Access to finance for innovative SMEs since the financial crisis 2015*

¹⁰² Nikolaidis, *What are manufacturers' attitudes towards external finance?*, 2016

manufacturing SMEs using external finance has declined from 49% in 2012 to 38% in 2016, and the number of permanent non-borrowers has increased from 32% in 2012 to 46% in 2016.¹⁰³ In fact, 71% of total SMEs preferred to fund themselves and grow at a slower rate than borrow more.¹⁰⁴ The result of this reluctance to borrow has been a restriction on the growth of new firms.

The primary reason for SMEs' reluctance to borrow has been significant distrust in major financial institutions since the financial crash. Relying on their own resources appears to be a safer option in the current climate. This has been reinforced, according to the Competition and Markets Authority, by the fact that banks are not competing hard enough to win new customers.¹⁰⁵ There is increasing need for greater competition in the banking sector if manufacturing SMEs are to start borrowing, and growing, again.

4.6 Bankruptcy Laws

Risk is an essential element of a vibrant entrepreneurial culture. It is the means by which innovative ideas are put to the test. Many start-ups end in failure and bankruptcy, but if bankruptcy laws are too severe, in order to mitigate risk, then it becomes a greater struggle for entrepreneurs to thrive. Evidence suggests that the less risk there is involved in filing for bankruptcy, the more new firms are founded.¹⁰⁶

The US Bankruptcy Code, otherwise known as Chapter 11, encourages new businesses to take risks on innovative ventures by focusing on rescuing businesses instead of closing them down. By facilitating a swift process, it increases the likelihood of an efficient reorganisation of the business. The direct cost of bankruptcy is another consideration, and in the US the cost is as low as 7% of a firm's assets.¹⁰⁷ There is also the lack of 'stigma' attached to bankruptcy in the US, leaving entrepreneurs free to try again if they fail. UK bankruptcy law, however, fails to provide the same level of support for unincorporated SMEs which struggle.

¹⁰³ BDRC Continental, *SME Finance Monitor Q2 2016*, 2016

¹⁰⁴ Ibid

¹⁰⁵ Competition and Markets Authority, *Making banks work harder for you*, 2016

¹⁰⁶ Strategy+Business, *The Impact of Bankruptcy Laws on Startups*, 2011

¹⁰⁷ Ibid

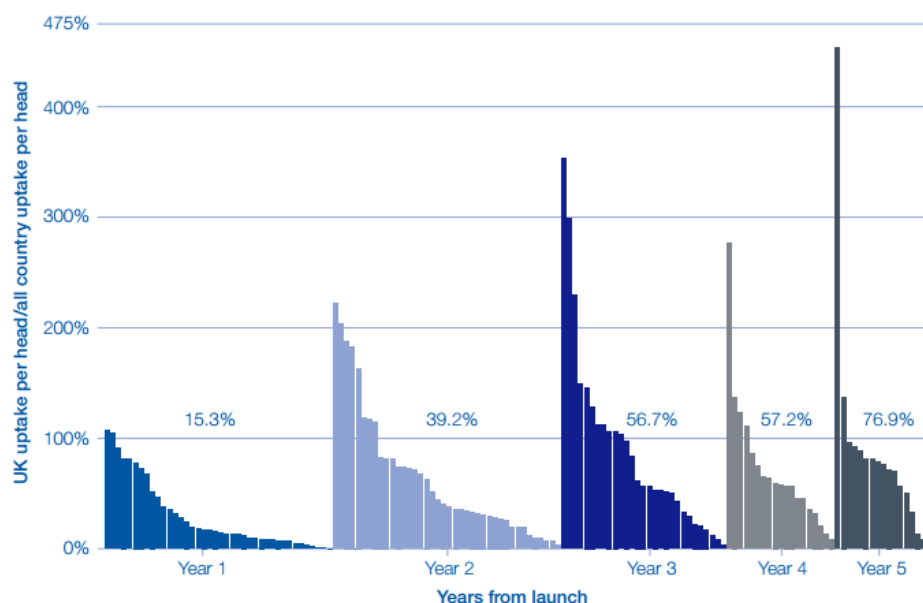
4.7 Problem relating to Public Services

The provision of public services can, in certain circumstances, be dependent upon certain manufacturing industries. This is particularly the case with the pharmaceutical industry and the NHS.

The UK's regulatory regime for pharmaceuticals – which is different to that in Mainland Europe in the sense that price controls in the form of statutory pricing do not exist¹⁰⁸ – has promoted cost competitive drugs for the NHS. Within the EU, the UK is ranked as cost competitive alongside countries such as Spain and Portugal – while Germany is at the upper end of the cost spectrum.¹⁰⁹

However, the UK performs very poorly in the take up of new medicines compared to comparator countries (see Figure 28). This means that the NHS is missing out on treatments available in other parts of the world. It is also threatening the UK's successful life sciences industry, which needs the NHS to adopt innovation and pay for treatments that work.¹¹⁰

Figure 28: Uptake of new medicines in UK compared to comparator countries



Source: UK Office for Life Sciences

¹⁰⁸ European Parliament Directorate General for Internal Policies, *Differences in Costs of and Access to Pharmaceutical Products in the EU*, 2010

¹⁰⁹ Vogler, Kilpatrick & Babar, *Analysis of Medicine Prices in New Zealand and 16 European Countries*, 2015

¹¹⁰ Daily Telegraph, *Big pharma will pull out of Britain unless we start paying for new drugs, warns AstraZeneca*, 2016

4.8 Issue of Tariffs and Non-tariff Barriers

Most OECD countries have relatively low tariffs on manufactured products but nevertheless tariffs do penalise exporters particularly hard in high-income countries. Removing tariffs altogether would contribute to product differentiation and higher export prices for developed countries' exports.¹¹¹

The UK's most significant export market is the European Single Market. In 2015, eight of the UK's top 15 import partners were EU members (Germany, France, Netherlands, Ireland, Belgium, Spain, Italy, Sweden) accounting for 38.2% of total UK exports at \$176.1 billion.¹¹² Free flow of goods and services with the EU has been, and continues to be, an important factor for the successful growth of the UK manufacturing sector. There is, however, a significant regulatory burden which comes with trading in the European Single Market. According to UK government impact assessments, the 100 most burdensome EU regulations cost the UK £33.3 billion per year.¹¹³ These regulations make it difficult for the UK and EU import partners to remain competitive in an increasingly globalised economy.

Brexit opens up new opportunities for trade with non-EU countries. The US is already a major export market for UK manufacturing. In 2016, the UK's manufacturing exports to the US were just under £30 billion.¹¹⁴ In 2015, the UK had a trade surplus with the US at \$9.1 billion.¹¹⁵ Already, 10.9% of UK car exports go to the US,¹¹⁶ and US demand for cars manufactured in the UK increased by 26.5% in 2015.¹¹⁷ There are, however, significant non-tariff barriers which have held back the growth of UK manufacturing exports. For example, procedures for testing vehicles adds 26% to the cost for both the EU and the US.¹¹⁸ It is clear that there is further potential for growth in UK-US trade should tariffs and regulations be reduced.

¹¹¹ OECD, *The role of services for competitiveness in manufacturing*, 2013

¹¹² Workman, *United Kingdom's Top Import Partner, World's Top Exports*, 2016

¹¹³ Open Europe, *Top 100 EU rules cost Britain £33.3bn*, 2015

¹¹⁴ The Guardian, *After the Trump victory, what now for small firms exporting to America?*, 2016

¹¹⁵ Workman, *United Kingdom's Top Import Partner, World's Top Exports*, 2016

¹¹⁶ The Statistics Portal, *Distribution of cars exported from the United Kingdom (UK) in 2015*, 2016

¹¹⁷ SMMT, *Best year in a decade for British car manufacturing as exports reach record high*, 2016

¹¹⁸ European Parliament, *TTIP: Motor Vehicles*, 2015

5. CONCLUSION

5.1 The need for new manufacturing

Although in recent times the balance of the UK's economy has shifted away from manufacturing, there is still a clear need for a thriving manufacturing sector. The UK already performs competitively in a number of manufacturing industries, and there are also opportunities for reshoring previously lost activity.

Moreover, manufacturing could help close the UK's productivity gap. The gains in productivity arising from manufacturing have far exceeded those achieved in the services sector. There is also a huge opportunity for manufacturing exporters to take advantage of the correction in the valuation of the Pound Sterling, which – according to pre-Brexit estimates by the IMF – has been overdue.

5.2 Industrial strategy

There are already a number of government interventions in the manufacturing sector. However, a significant expansion of government support and intervention in the sector would not equate to a successful strategy.

Interventions should be limited to:

- (a) areas where government purchasing is intrinsic to the market, which includes the relationship between the NHS and the UK's pharmaceutical sector;
- (b) the promotion of foreign direct investment – as has been successful in the US;
- (c) offering services to help facilitate manufacturing such as the Manufacturing Advice Service; and
- (d) promoting supply side policies to help boost the competitiveness of UK manufacturing.

5.3 Boosting skills for manufacturing firms

This is certainly an area where some elements of best practice could be learned from the German experience. The UK suffered from a number of skills shortages, and it is estimated that 800,000 manufacturing job vacancies will need to be filled by 2020, due to an aging manufacturing workforce.

The Government has introduced University Technical Colleges for 14-18 year olds, which combine technical, practical and academic learning;¹¹⁹ the establishment of 50 such schools have been planned by 2018. There will need to be an assessment of how successful these colleges have been in boosting the skills of UK workers, and whether the programme should be expanded.

There are also examples of colleges linked to specific industries. For example, the first national UK onshore oil and gas college was announced in 2014.¹²⁰ The Government may want to work in partnership with business to roll out similar colleges for different manufacturing sectors in the economy.

5.4 NHS & Pharmaceutical Sector

A major problem in the UK healthcare system is the slow take up of innovative medicines. This affects patients and threatens both the future of life sciences and the pharmaceutical sector in the UK. There is a need for NICE to update its methods and decision making processes, so that the UK's regulatory regime is fit for the current and future medicines pipeline.¹²¹ The Government should also seek to connect the UK's pharma sector with the NHS to help spur the adoption of innovation – as was recently recommended by the Accelerated Access Review.¹²² It has been reported that the NHS is overpaying for medicines by between £380 million and £1 billion.¹²³ Cost savings in this area could be ploughed back into funding for new innovative drug treatments.

5.5 Electricity Policy

The UK Government will need to offer reassurance to manufacturers over the UK's energy security and the costs associated with electricity provision. A number of gas fired power stations need to be urgently constructed in order to fill the gap created by the closure of coal fired power stations and shore up the UK's energy security. Moreover, evidence suggests that UK manufacturers – particularly energy intensive firms – face punitive electricity costs that are

¹¹⁹ University Technical Colleges, *Overview*, 2016

¹²⁰ Department of Energy & Climate Change, *Skilling up shale: First national UK onshore oil and gas college announced*, 2014

¹²¹ Association of the British Pharmaceutical Industry, *Availability and pricing of branded medicines*, 2014

¹²² Accelerated Access, *Review of innovative medicines and medical technologies*, 2016

¹²³ The Times, *Health service pays up to £1bn too much for drugs*, 2017

hindering competitiveness. The UK Government should announce a review of the impact that high electricity costs are having on manufacturers, particularly the UK's energy intensive firms that have to deal with limited compensatory measures at the current time. It is particularly important that UK manufacturers are not penalised compared to their EU counterparts. This, among other things, will, in all likelihood, involve repealing the unilateral Carbon Price Floor.

5.6 Airports

Manufacturing firms have been attracted to the area around Heathrow due to its networking services. But there is uncertainty caused by indecision over airport expansion. It is estimated that 2.1 million tonnes of freight – equivalent to half of all freight demand in 2050 – will have to be trucked away from London airports if there's no airport expansion.

It is welcome that the Government has indicated its support for Heathrow expansion – yet a number of hurdles remain. The parliamentary vote has been delayed for a further year. It is vital that the Government gives certainty to manufacturing firms – and other businesses – about the expansion of airport capacity in the South-East of England.

5.7 Free ports

EU law has long held back the potential of British ports. The UK's membership of the EU means that the UK is currently unable to operate foreign trade zones around seaports. So-called "Free Ports" could increase manufacturing output, reinvigorate the north of England, and promote trade.¹²⁴

Free Ports are areas that, although inside the geographic boundary of a country, are considered outside the country for customs purposes. This means that goods can enter and re-exit the port without incurring the usual import procedures or tariffs – incentivising domestic manufacturing. It is also notable that UK Ports are often in areas of relatively high socio-economic deprivation, which adds to the case for promoting Free Ports.

Foreign trade zones operate all around the world – except in the EU. The Government should seek to introduce Free Ports post-Brexit to boost manufacturing industries and coastal areas.

5.8 Access to Finance

If retail banks are to become more innovative and responsive to the diverse needs of manufacturing SMEs, as well as customers in general, then greater competition within the banking sector will be required. This can be largely achieved by promoting a more liberalised and diverse banking sector with

¹²⁴ Centre for Policy Studies, *The Free Ports Opportunity*, 2016

measures such as encouraging challenger banks. Despite the dominance of the 'big four', a new generation of 'challenger banks' have entered the sector since 2008, and have adopted a specialised approach which focuses on under-served markets.¹²⁵ The growth of these banks should be encouraged by lowering the minimum capital requirement for new small banks.

5.9 Making Bankruptcy Law Work for Entrepreneurs

In 2002, the Labour Government passed the Enterprise Act which reformed administration procedures for bankrupt businesses so more companies could be rescued, but it only applied to limited companies or partnerships, not unincorporated SMEs. This has left some SMEs vulnerable when they run into difficulty as banks can then exploit the situation by forcing them to pay high management fees and high interest rates. There are also key respects in which UK bankruptcy law is currently lacking, especially in regard to the reorganisation process and debt relief.

To remedy this situation, the Government could seek to introduce new legislation that could:

- Extend the administration procedure established under the Enterprise Act 2002 to unincorporated SMEs. In addition to this, the power of receivers over SMEs could be limited and their fees capped.
- In the event of liquidation, there should be 'fresh start' provisions which make it easier for entrepreneurs to set up new businesses. For example, debtors should be released from personal liability so the future earnings of entrepreneurs can be protected, and a percentage of the firm's assets would be protected from creditors so they can be used for future ventures.

Reforming bankruptcy laws would lead to more failures, but it may be an acceptable price to pay to increase the number of productive firms and boost the wider economy.

5.10 Tariff & non-tariff barrier policy

As the UK's largest export market, it is imperative that access to, the European Single Market is acquired. Continuing membership of the Single Market would certainly maintain tariff-free access to EU markets, but would also continue the burdensome regulatory regime which has reduced UK competitiveness. It is also politically unrealistic – given that the Government is committed to ending freedom of movement rules.

The Government's Brexit strategy should include the following priorities:

¹²⁵ Daily Telegraph, *Are challenger banks the saviours of British banking?*, 2015

- **EU FTA:** The UK should join EFTA and negotiate a Free Trade Agreement (FTA) with the EU regarding goods and services. The CETA free trade agreement between Canada and the EU provides a sound example of the kind of trading relationship which would benefit the UK and the EU.

Great Repeal Bill: The Government has already committed itself to enact a Great Repeal Bill to incorporate EU legislation into UK law post-Brexit. This would be an ideal opportunity to reduce the regulatory burden on UK manufacturing, as well as the wider UK economy.

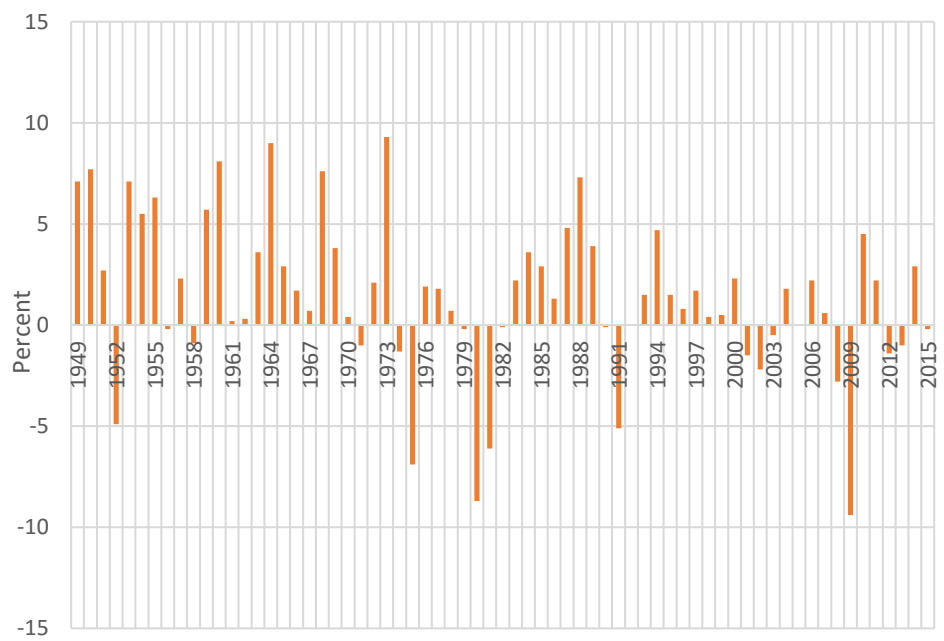
- **US FTA:** A bilateral free trade agreement with the US should be a top priority for the Department for International Trade. The incoming Republican administration's trade policy is likely to be hostile to low wage economies such as Mexico and China, whereas the UK and other developed nations are more likely to be treated favourably.
- **Asia Pacific FTAs:** There should be a strong effort to boost British exports to growing economies in the Asia Pacific region. China is already the UK's fastest growing export market, and UK exports to China in 2015 made up 5.9% of total exports worth \$27.4 billion.¹²⁶ Hong Kong and South Korea are also important import partners worth 3.6% of total exports in 2015.¹²⁷

¹²⁶ Workman, *United Kingdom's Top Import Partner, World's Top Exports*, 2016

¹²⁷ Ibid

APPENDIX A

Figure 1A: UK manufacturing annual growth rate



Source: Office for National Statistics.

Figure 2A: UK manufacturing annual growth rate, structural break

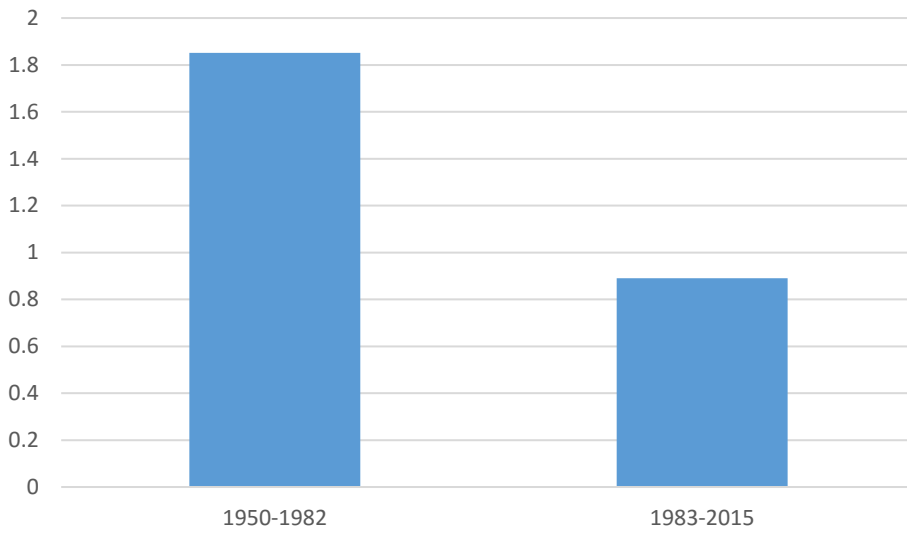
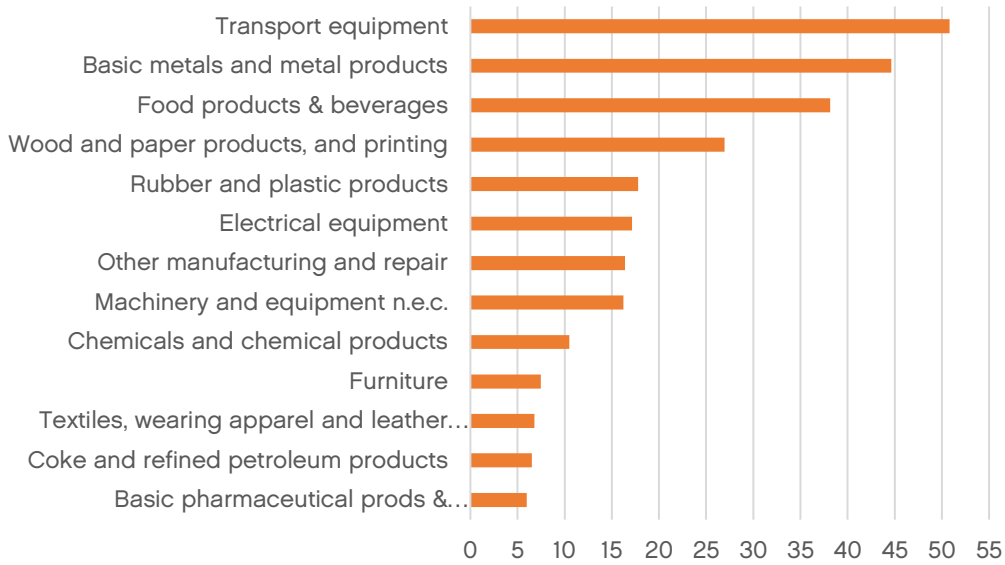


Figure 3A: UK 2015 manufacturing export turnover by sector, £ billions



Source: *Office for National Statistics.*

APPENDIX B

How has the Government tried to promote manufacturing?

1. Policy direction

In the 2013 Government report *The Future for Manufacturing*, four key characteristics of manufacturing over the following 20 years were identified:

- **More responsiveness to consumers and customers.**
Manufacturers will be quicker to respond to and adopt new technologies; products will be increasingly customisable; new technology (for example, additive technology and nanotechnology) will enable production away from factories; digital technology will increasingly alter supply chains, including in product verification, customer communication and logistics management.
- **Exposure to new markets.**
Continued growth of consumer base in BRIC countries and 'next 11' countries will increase demand, but the UK's main export destination will probably remain the EU and the US; high-tech and high value products will remain a UK strength in export markets; increasing personal wealth and the aging population will influence the sort of products the UK produces; levels of foreign direct investment in the EU and UK may change, meaning funding for manufacturing may alter; continued fragmentation of production chain, with outsourcing and offshoring continuing as new manufacturing bases become viable, but some functions will be re-shored to the UK.
- **More sustainable processes and products.**
Increased global populations and increased urban populations will put additional pressures on land, water, energy and materials; climate change will cause increased disruption to supply chains because of more extreme weather events; increased regulation of the environment will promote greater resource productivity; customers will demand more environmentally friendly

production processes; emergence of ‘circular economy’ in which products are reused, remanufactured, recovered, recycled and increased ‘cascaded use’ (using products for lower value use, for example, using old computer hardware in less demanding applications).

- **Increasing dependence on high skilled workers.**

A larger working population with increased skills levels will mean an increased talent pool for employers to choose from; future demand for STEM qualifications will outstrip supply; precise technical skills will be mixed with more general aptitudes for project management and problem solving as factories become more technologically advanced.

The report identified three ways in which the government’s approach to manufacturing policy will have to change:

- A more integrated view of the manufacturing sector (including pre and post-production as well as the actual production processes).
- Interventions will be more targeted, on specific sectors and on parts of the production process.
- Institutions within Government must be able to respond and act in the long-term to secure future growth in the sector.¹²⁸

2. Main manufacturing policies between 2010-2016

The strength of the UK’s long-term growth rate over the last two centuries can be attributed in large-part to the expansion of its manufacturing sector.¹²⁹ The sector’s successes in innovation; attracting and returning on investment; and ultimately in boosting exports, productivity, employment and wages – among other benefits – is recognised as potential that can still be harnessed by 21st century Britain, and promoted by government policy.¹³⁰

In acknowledgement of this, the Government has, since 2010, launched (or extended) several major policy strategies to address the downward trend experienced by the UK manufacturing sector in recent years. These are:

- 1. The Regional Growth Fund (2010)**
- 2. High Value Manufacturing Catapult Centre (2011)**
- 3. Advanced Manufacturing Supply Chain Initiative (2012)**

¹²⁸ BIS, *The future of manufacturing: a new era of challenge and opportunity for the UK*, November 2013

¹²⁹ Barrie Trinder, *Britain’s Industrial Revolution: The Making of a Manufacturing People, 1700-1870*, 2013

¹³⁰ BIS, *The future of manufacturing: a new era of challenge and opportunity for the UK*, November 2013

4. **Manufacturing Advisory Service (2012)**
5. **Government programmes to support careers in manufacturing (2013-2016)**
6. **Innovate UK – Funding competition: manufacturing and materials (2016)**

3. *The Regional Growth Fund*

The Regional Growth Fund sought to stimulate private sector investment by providing support for projects that offer significant opportunities for growth and employment.

The fund is competitive, with bidders competing for funds in different rounds, the first of which covered 2011/12 and 2012/13.

By March 2014, the Fund had allocated a total of £1.5 billion to various different types of businesses, many of which involved manufacturing.

4. *High Value Manufacturing Catapult Centre*

The Catapult programme is a network of regional “Catapult centres” intended to transform the UK’s capability for innovation in specific areas and help drive future economic growth.

The centres do this by providing high-tech manufacturing infrastructure required for innovation and production (and ultimately economic growth) directly to scientists, engineers, entrepreneurs and investors who otherwise would not have (or have limited) access to it. The policy focuses on global markets with significant growth potential and industries in which the UK already has a leading edge. Geared toward growth of UK companies, investing millions in them annually.

So far 10 Catapults have been launched:

1. Cell therapy
2. High Value Manufacturing
3. Offshore renewable energy
4. Satellite applications
5. Digital
6. Transport systems
7. Future cities
8. Energy systems
9. Precision medicine
10. Medicine technologies

The High Value Manufacturing Catapult (HVMC) is based in seven research centres spread across the country, with each centre having a specific focus on an area of manufacturing – ranging from the Advanced Forming Research Centre (AFRC) in Glasgow to the National Composite Centre (NCC) in Bristol. The centres are available to businesses which can demonstrate that they have a product or idea, and require the expertise or equipment that the centres can provide.

The HVMC has received over £200 million of Government investment since 2011. The overarching aim of the Catapult is to “significantly grow the contribution of the manufacturing sector to the UK economy”.¹³¹

5. Advanced Manufacturing Supply Chain Initiative

Former Business Secretary Vince Cable announced the creation of the Advanced Manufacturing Supply Chain Initiative (AMSCI) on 6 December 2011. The AMSCI is a competitive fund that provides subsidies for capital investment, research and development expenditure, and training for industrial projects involving collaborations across supply chains (including projects involving the re-shoring of manufacturing operations to the UK). A total of 168 applications have been received across the various AMSCI funding rounds, of which 58 were approved for funding.

Up to £125 million was initially made available through the initiative to “improve the global competitiveness of UK advanced manufacturing supply chains”. Following the closure of the initial investment round, companies were then invited to express interest in applying for funding via a second round, which opened for applications in September 2012.

Suppliers, including small and medium sized enterprises, were encouraged to submit joint proposals with a sectoral level impact to improve the efficiency of supply chains.

Applications for funding were invited in two streams. The first stream offered funding of up to £100 million for schemes seeking to make an impact on any manufacturing sector and in any part of the country. The final deadline for applications was in September 2012. The second stream offered £25 million to schemes working as part of the aerospace or automotive supply chain and based in the Local Economic Partnership regions of Black Country, Coventry & Warwickshire, Greater Birmingham & Solihull or Liverpool City Region. The deadline for applications was in June 2012.

In total, the first stream received 32 bids with a total ‘funding ask’ of £90 million. In late November 2012, the then Department for Business, Innovation and Skills (BIS) announced that £80 million worth of bids to the stream had been

¹³¹ Catapult High Value Manufacturing, *Our Mission*, 2017

successful. These bids were from 11 different projects working across the automotive, aerospace and chemical sectors.

The then Chancellor of the Exchequer, George Osborne, announced an additional £120 million in the Autumn Statement 2012 for two further rounds of AMSCI funding, which took place in 2013 and 2014.¹³²

6. Manufacturing Advisory Service

The Manufacturing Advisory Service (MAS) was first established in 2002 and expanded in 2004. Its purpose is to help manufacturing companies improve their productivity and competitiveness by offering them professional advice and support. The MAS has in the past been funded by the nine Regional Development Agencies (RDAs) in England and by the Devolved Administrations in Scotland and Wales and has operated through Regional Centres. 14 RDAs have now been abolished by the Government. The MAS, however, has been retained and re-launched as a national service.

In December 2010 BIS announced funding of £50 million for the service over the period 2011-12 to 2013-14.¹⁵ The Plan for Growth announced that:

The Government has committed £50 million over three years from April 2012 to provide an enhanced service through MAS, tailored to suit the needs of individual business and the local economic environment. The Government is introducing the new service from 1 Jan 2012, so that manufacturers can access it 3 months earlier than planned. Working with expert partners where appropriate, BIS will develop additional specialist services for firms in developing markets such as offshore wind, and low carbon cars.

On 14 October 2011 the Government announced that the MAS would become nationally rather than regionally provided, and that it would specifically focus on SME growth.

The Manufacturing Advisory Service continue to deliver a national service to all manufacturing businesses in England and Wales but the new consortium now means that there will be a specific focus on:

- driving business growth through strategic and technical support for SMEs developing advanced manufacturing capabilities and creating high value jobs;
- enabling business improvement with manufacturers operating in global supply chains; and
- linking SMEs with the apprenticeship programme delivering a minimum of 1,250 engineering and manufacturing apprenticeships nationally.

¹³² Department for Business Innovation & Skills, *BIS Research Paper No. 234: Advanced Manufacturing Supply Chain Initiative (AMSCI): Impact and Economic Evaluation Scoping Study*, 2015

The new national Manufacturing Advisory Service was launched on 3 January 2012.

7. Government programmes to encourage careers in manufacturing

Reflecting the changing composition of the sector, employment in manufacturing has been in long-term decline since the 1970's.¹³³ To some extent this trend is to be expected, particularly due to advanced manufacturing activity – which has significantly increased over the last several decades – requiring relatively less labour. However manufacturing employers increasingly report difficulty in recruiting new workers, particularly due to a weakness in technical skills among applicants.¹³⁴

To address this, recent Governments have introduced a variety of policies aimed at promoting skill-development within the workforce, the attractiveness of manufacturing to prospective university applicants and graduates, and engagement between employers and jobseekers.

The following are several examples:

2011 November “Make it in Great Britain Campaign” launch

- A campaign that tried to use ‘industry champions’ to renew confidence in UK manufacturing.
- Exhibitions held at venues like the London Science Museum were used to promote the campaign, focusing on new innovations yet to be brought to the market.

2012 Employer Ownership of Skills Pilot

- Aimed to invite employers to develop proposals that increase the skill level of workers, offering joint investment opportunities with the government.
- Two rounds of project were launched, with many employers bidding for projects.

2013 Industrial Strategy: Construction 2025

- Among other aims – such growing Britain’s construction market, boosting investment in infrastructure and trade, and developing supply chains – the strategy also aimed to develop a specialist apprenticeship programme (including for the manufacturing sector), and encourage more research and development in the manufacturing.

2014 See Inside Manufacturing Campaign

¹³³ Office for National Statistics, *Labour Market Statistics*, 2016

¹³⁴ EEF, *EEF Skills Report 2016: An up-skill battle*, 2016

- An initiative piloted by the automotive sector, in which the sector “open(ed) their doors to students and young people to help change the perception of careers in the in the sector and attract the next generation of engineers and technicians”.

2015 UK Commission for employment and skills UK futures program – competition number 4: Skills for innovation in manufacturing

- £1 Million was made available to companies with accepted proposals, with a maximum of £150,000 per accepted proposal.

2015 UK commission for employment announced accepted proposals for the 4th future programme

- Five organisations were chosen by the future program for manufacturing, testing new ways to develop skills for innovation in manufacturing.

2016 Apprenticeship Levy announced, introduced 2017 April

- A 0.5% levy was introduced on company’s annual paybills in excess of £3 million, less than 2% of UK employers are expected to qualify. Funds raised will be placed in the hands of the digital apprenticeship service.

8. Innovate UK – Funding competition: manufacturing and materials

In May 2016, Innovate (a government body established to drive science and technology innovation) announced a new £15 million investment into innovation projects in manufacturing and/or materials. These projects will focus on identified technical or commercial challenges. The Agency will fund projects that aim to lead to increased UK SME productivity, competitiveness and growth.

The projects need to be led by a business and must involve at least one small- or medium-sized company (SME). They can be carried out by an SME working alone or in collaboration with other organisations. Projects with costs of £100,000 or more must involve working with other partners

The Agency is looking for projects which focus on any of the technical feasibility, industrial research or experimental development research categories. Projects should last between six months and three years, and range from total costs of £50,000 to £2 million.

9. Minor Manufacturing Policies

2013 Industrial Strategy: Construction 2025

The aims of the strategy are to:

- capitalise on growing global construction market and to help boost economic recovery after the recession;
- boost investment in infrastructure (public transport services, roads and energy services, to help lower the costs of construction);
- reduce the trade gap between total exports and total imports for construction products and materials;
- reduce emissions costs;
- boost investment in housing, accelerate house development, increase affordability and increase demand;
- instigate development of a more efficient digital economy;
- address high redundancy and low vacant rates by developing a specialist apprenticeship programme;
- develop supply chains;
- encourage more research and development within the manufacturing sector; and
- provide leadership with a Sector Council, comprising senior business people representing key industry bodies and senior representatives.

2014 Launch of the Reshore UK service

- Aimed to bring overseas production back to the UK, instead of outsourcing elsewhere, by providing a matching and location service to help identify UK-based supply chains for companies, made possible by data from the manufacturing advisory service.

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