

## **The impact of Covid-19 on UK manufacturing firms and supply chains**

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## **1. Introduction to the project & report**

### 1.1 Introduction

This paper reports on the first phase of an 18-month research project funded by the UK's Economic and Social Research Council (Grant Ref: ES/V015621/1). The project sets out to investigate the impacts of the Covid-19 pandemic on the UK manufacturing industry, identify vulnerabilities and explore scenarios for UK manufacturing supply chains.

### 1.2 Background

The idea for the project came about back in July 2020 when UKRI were inviting applications for research to look at different aspects of the pandemic. The research team, who were working with manufacturing firms at the time, were concerned that little work was being done to investigate the impact of the pandemic on UK manufacturing. And yet there were lots of worrying flags. For a start we were seeing the loss of jobs, we were hearing of challenges in the supply chain, and we were witnessing companies shutting their doors. Every day we were seeing these things on the news and in our dealings with the manufacturing community and through feeds on social media. The team developed a proposal to investigate not just the impact of the pandemic, but to look at future scenarios for manufacturing and the capabilities that will be important going forward.

The paper will focus on Phase 1 of the project, and report on work carried out in the period Nov 2020-April 2021. The report seeks to present evidence of the effects of Covid-19 on UK manufacturing firms and supply chains. It also pulls together in one place a lot of the evidence regarding the impact of the pandemic on the manufacturing sector. As such, the report should be of interest to anyone interested in understanding the current situation with respect to the manufacturing sector.

### 1.3 Objectives of Phase 1

The first phase of the project was about understand the manufacturing landscape and the impacts of the pandemic on firms and their supply chains. This work was undertaken in the first six months of the project Nov 2020-April 2021.

Anyone interested in the subsequent phases of the project (which runs until April 2022) can find further details of the project at

<https://gtr.ukri.org/projects?ref=ES%2FV015621%2F1>

### 1.4 Approach

Phase 1 of the overall project aimed at establishing a clearer understanding of the impact of the pandemic on manufacturing firms, and a picture of the challenges ahead, as perceived by the businesses themselves.

The researchers built up this understanding using a number of tools. Firstly, the team investigated the existing literature, both academic literature and reports from government, trade bodies, media reports and other projects that could shed light on the issue. An online survey was used to gather insights on the impact of the pandemic

and to establish how attitudes to innovation have changed both in the firm and across the supply chains. A richer picture was gained through interviews with 20 manufacturers, with trade bodies, professional associations and support organisations including regional development bodies. The interviews were done online using Zoom and Teams and targeted senior people from firms at different positions within key supply chains, as well as some trade organisations, and support organisations. Open ended interviews were designed based on academic knowledge of innovation capability, supply chains and organisational learning. The interviews, typically around an hour in length, were recorded and transcribed. Data coding and the identification of key themes emerging from the interviews were then combined with the findings from the survey. The emerging themes were tested out at an online event in February, where attendees were polled about attitudes to key topics. This report is an intended as a milestone report, reporting on high level findings, rather than an in-depth academic analysis. Further papers will pull together a more academic analysis of the situation and dig deeper into the evidence.

## **2. Insights from secondary research**

The first step in building an understanding of the effect of Covid on UK manufacturing was to pull together evidence that was already in existence. The situation was obviously fast moving and fluid, with new evidence emerging real time. When we initially proposed this research, in early summer 2020, there was very little evidence in the media or academic literature talking about the impact of Covid on UK manufacturing. However, by the time the project started in November 2020 we had started to see far more evidence and commentary. The research team looked for evidence from other academic studies, from government reports, trade body insights, consultancy firms as well as constantly scanning media reports and some social media. Many of these reports will be used in conjunction with the findings of the survey and interviews in the discussion. In this section we will outline some of the headline facts and figures, along with emerging themes. Anyone interested in digging deeper will find a very rich list of references and further reading at the end of this report.

### **2.1 General Economic Situation**

We have been getting good information throughout on the general economic picture (without talking about the impact on manufacturing firms specifically). For example, regular ONS reports<sup>1</sup> give insight into the effect of Covid on our economy. This data tells us that just after the first lockdown GDP plummeted 20% in April 2020. This was the lowest point, and GDP has since climbed. However, a year on, the latest figures for GDP in Feb 2021 is still 7.8% lower than pre-Covid levels in Feb 2020.

In terms of job losses, ONS data<sup>1</sup> tells us that the biggest rise in redundancy happened in the early days of the pandemic before any job retention scheme (April 2020) and then again in October 2020 when furlough was initially expected to end. The most recent ONS data suggests that in the period Dec 2020-Feb 2021, 4.9% of economically active people over the age of 16 are unemployed. This is better than many had predicted. Unemployment has risen, but furlough has protected many jobs. However, with furlough being extended until September 2021, many believe that further redundancies are to be expected later in the year. Reports (e.g. from the Office

for Budget Responsibility<sup>2</sup>) suggest that 2.2 million people, or 6.5% of all workers, could be unemployed at the end of the year

## 2.2 Reports on UK manufacturing industry

Moving on to consider UK manufacturing, a number of sources report on the manufacturing sector at a macro level, including more detailed analysis from ONS<sup>3</sup>. Make UK<sup>4</sup> and their “Manufacturing Monitor” shows the pulse of UK manufacturing and their concerns at an aggregate level. Other high-level insights come from academic studies (e.g., the Centre for Economic Performance<sup>5</sup>), from consultancy firms (e.g. PWC<sup>6</sup>) and from various sectoral bodies (e.g. Oil & Gas UK<sup>7</sup>, SMMT<sup>8</sup>). A reasonably comprehensive list of reports can be found under “further reading” at the back of this report.

### Output

Many manufacturers were able to continue with production during lockdown. A lot of “non-essential” manufacturers shut their doors in the early weeks of the first lockdown but as time went on more and more opened and stepped-up production, particularly with improved health and safety measures meaning more people could return to work. In the most recent ONS<sup>9</sup> update (Business insights and impact on the UK economy Wave 25: 08 February to 21 February 2021) 81.0% of manufacturing businesses who responded to the survey were currently trading and had been during the previous two weeks. Again, ONS data for February 2021 suggests that monthly manufacturing grew by 1.3% but remains 4.2% below its February 2020 level.

### Jobs

A UK wide survey by Make UK<sup>3</sup> suggests that just over half of their respondents (52%) from the manufacturing community have made people redundant due to the pandemic over the past 12 months. A survey by Scottish Engineering reported that 60% of Scottish respondents said they already had or were going to make people redundant. The Scottish Engineering survey also estimates that overall job losses in the sector could average 13%, with a “significant proportion” of these people expected to retire or otherwise leave the sector for good. These figures are particularly worrying for a sector that was reporting a problem with an aging workforce pre-Covid. Now we are seeing many of those exiting manufacturing firms are the over 50s who are opting for retirement (either voluntary or not). The number of unemployed over-50s in the general population has increased by a third in a year, according to new analysis<sup>10</sup> of data from the Office of National Statistics (ONS).

At the other end of the spectrum is the issue of younger people coming into the manufacturing sector. In February 2021 “The Manufacturer”<sup>11</sup> reported on the latest In-Comm Training Barometer, which revealed that 64% of companies had failed to invest in new apprentices over the last twelve months. The survey reported more than half of respondents were shelving plans to take on younger workers in the next 12 months and training budgets were also being cut. The barometer did however suggest that 9 out of 10 companies had managed to retain their existing apprentices despite the crisis. “Personnel Today”<sup>12</sup> reported in February 2021 that there had been a significant

drop in apprenticeships around manufacturing technologies, with 5,993 apprentices joining between March and July 2019 dropping 57% to 2,557 in the same period 2020.

The Job Retention Scheme has obviously supported jobs in the manufacturing sector, with Make UK<sup>3</sup> reporting that around 80% of manufacturing firms responding to their survey having used furlough to some extent. Regional data gives a similar picture, in Scotland 83% of manufacturers are reported to have used Furlough<sup>11</sup>. So, the worry is with government support ending in September 2021, we are likely to see more job losses in the coming months.

### Sales & Orders

We are seeing somewhat differing reports when it comes to sales and order books. Likely due to different parts of the economy being affected in different ways. Make UK believe that the worst point 80% of firms responding to their survey reported a fall in sales. In Scotland it is reported that nearly half of all manufacturing firms have reported a decrease in turnover as a result of Covid. The Scottish Government is reporting that manufacturing output contracted by 23.1% over the past 12 months<sup>13</sup>. The most recent survey data from Make UK shows a more positive picture. A study by the London School of Economics<sup>14</sup> suggests SMEs were badly affected in terms of drops in turnover. But it is not across the board, the same study reports on many SMEs seeing significant increases in turnover. Another study in the South-West of England<sup>15</sup> suggests 14% not affected and 25% have seen an increase in trade. While 64% of those engaged in the Manufacturing Growth Programme (MGP) said orders had fallen<sup>16</sup>.

### 2.3 Sector Insights

Some reports have focused on specific sectors and there have been numerous reports in the media. In this section we pull out some highlights and point to further sources of information. It is clear that certain sectors have been hit far harder than others. Anyone with direct links to travel and transport, to entertainment and hospitality has been hit hard. Fashion and textiles have also been hit, with people not going out, and not buying fashion clothes. Food & drink shows a mixed picture with those supplying the hospitality and travel industries seeing sales slump. Whilst sales of things like biscuits, ice cream and alcohol being drunk in the home going up. Some in pharmaceutical and life sciences have been busy – certainly anyone related to testing, vaccination, ventilators etc. In the following paragraphs we will pull out just a few of the headlines in relation to key sectors.

Automotive is important to the UK economy as it employs significant numbers of people. However, the volume car manufacturers tend to be overseas owned and the automotive sector in the UK has been in steady decline since 2017<sup>13</sup>. According to the Society of Motor Manufacturers and Traders (SMMT)<sup>14</sup>, 2020 output from UK car plants dropped by 29% compared with the year before (~921,000 cars) which is the lowest level since 1984. Nissan overtook Jaguar Land Rover as the biggest British manufacturer. The same report says that all the big car plants were closed at the start of the pandemic, and in the UK some plants remained closed for months as they brought in new social distancing measures. With lockdown car showrooms were

forced to close and sales plummeted. Of course, automotive manufacture in the UK also includes commercial vehicles, and major players such as Alexander Dennis were also badly hit, and reported significant job losses<sup>15</sup>.

Aerospace is also a significant employer (accounting for 111,000 jobs directly) and a significant player in balancing UK trade as 95% of manufactured goods are exported<sup>16</sup>. There are a number of large companies as OEMs and up to 2500 smaller ones in the supply chain<sup>16</sup>. Through Covid-19 almost all OEMs had to cut jobs in significant numbers<sup>17</sup>.

Food and drink is the largest manufacturing industry in the UK accounting for about 20% of all manufacturing turnover<sup>20</sup>. UK food and drink industry operates at a medium level of automation which is actively thought to be raised by UK policy<sup>19</sup>. This is an industry that already struggles to attract talent. The covid-19 distancing rules are difficult for many to put into place while maintaining a similar operational level. Brexit is considered the larger issue for the industry with around 1 in 4 workers coming from the EU<sup>3</sup>. Further the industry depends on free trade with the EU and there is worry around Brexit which has been widely discussed in the media.

Oil and Gas is an important industry sector in the UK with about 260,000 employees. The industry is said to have a strong supply chain in the UK. Scotland, considered the oil and gas hub of Europe, hosts 2000 supply chain firms alone. There is particularly strong offshore oil and gas supply chain. The industry was highly impacted by a significant drop in air and car travel. Further, Covid-19 distancing rules complicate offshore operations. As a consequence, in offshore operations 4,000 jobs were lost in March 2020 and high numbers of supply chain staff were furloughed<sup>7</sup>. Since the industry heavily relies on export, Brexit is expected to have a significant impact as well. 50% of the sector turnover is directly generated by exports. Consequently, tariffs might have a damaging effect.

The chemicals and pharmaceuticals industry employ about 160,000 people directly and generates a turnover of about £40 Billion per year<sup>20</sup>. The sector is very diverse including the manufacture of commodity/bulk chemicals, speciality chemicals, polymers and consumer chemicals. It is principally comprised of approximately 2,500 SMEs these make up 97 % of the sector with a small number of large multinational companies comprising the other 3%. The sector has complex supply chain flows with multiple border crossings of intermediate products in the supply chain. Further the industry in the UK is believed to be innovative<sup>21</sup>. The industry has been hit hard as a supplier for other hard-hit industries like automotive or aviation. On the other hand, there were shortages of crucial pharmaceutical supplies which has caused companies to relocate production of these products back to the UK<sup>6</sup>. However, the sector faces a large Brexit impact as the EU is the largest importer of UK chemicals. Further, production of non-critical products will be more expensive due to tariffs on multiple border crossings of supply throughout the supply chains<sup>22</sup>.

## 2.4 Emerging themes

In this section we will pull out some of the key signals coming from the headlines of other studies, reports and media commentary. Again, more detailed discussion will take place later in the report.

### *Innovation becoming an imperative*

The effects of COVID-19 have rippled across every industry, but its impact on manufacturers has brought positive change, as well as disruption. As a result of lockdown, businesses and factory floors had to evolve at speed. The disruption was a catalyst for change – at least in some sectors of manufacturing.

### *Accelerating digital uptake*

One area that we know is important is the digital transformation of manufacturing. And Covid has accelerated that journey for so many.

A number of reports point to Covid accelerating digital take-up, not least reports by Make UK. In a study by LSE 90% of businesses said that Covid has accelerated or triggered the introduction of new digital technologies and changes in management practices. About 70% consider these changes to be profitable in the future and making processes more efficient.

### *Changing the way we work*

Lots of reports have told us that many businesses will not return to the working patterns and places of pre-covid.

### *Pivoting and business model change*

We saw lots of headlines about businesses “pivoting”. Initially many manufacturers moved away from their normal production to support the manufacture of essentials to deal with the pandemic eg. BrewDog making hand sanitiser, Dyson supporting the ventilator challenge etc. More recently we have heard more firms changing their business model in a more long-term way, using the opportunity of furlough as a chance to stop and think about a different future.

### *Changes in supply chain*

There have been positives and negatives. Starting with the positives, we have seen many stories of new partnerships and suppliers. A big win was the Scottish Government creating new PPE supply chains- before the pandemic the NHS was buying practically no PPE from the UK, but now is getting up to 90% from Scottish suppliers. Manufacturers of everything from camping equipment to clothes switched production to create the PPE needed. And we have seen other good new partnerships being created around ventilators and other Covid related supplies.

But there have also been serious issues in some supply chains with shortages being blamed on both Covid and Brexit. Indeed, in January 2021 supplier delivery times for UK manufacturing were the longest they have been in 30 years according to the IHS



Markit/Cips purchasing managers' index. Other evidence comes from the Manufacturing Growth Programme (MGP) who reported that 59% of respondents reported experiencing issues with their suppliers. Nearly two thirds had seen delivery times lengthen, whilst 40% had seen an increase in costs including products, materials and services.

### *Reshoring*

We have seen quite a lot of discussion around reshoring in the media. Academic papers also point to this trend<sup>23</sup> which started before the pandemic, but the pandemic (along with Brexit and other trade issues) is believed to increase that development. The pandemic made many countries realise how dependent they are on goods produced overseas<sup>24</sup>.

## **3. Findings from primary research**

In this section we will present the findings of our own primary investigations using survey and interviews as well as direct conversations with industry bodies and support organisations and feedback from online events and polls. This gives us a far richer picture than the secondary data alone.

### 3.1 Generic Issues

Under this heading we discuss issues that came out in nearly every interview we carried out. These were things that people wanted to talk about and were common across manufacturing.

#### *Government support*

The manufacturing organisations interviewed had all made extensive use of furlough. It has been a “life saver” for most industry sectors to retain jobs but also to keep national supply chains working. However, there is nervousness in many quarters about redundancies and bankruptcies after the furlough schemes run out. Good management teams, looking to the future have used the support to take time to think about the future and design and implement new strategies. We have heard a number of very positive stories of companies taking the opportunity to “reset”. Hopefully this “breathing space” or “fire break” will enable these firms to come back in a much stronger position.

Government bodies, industry support organisations and universities have all played an important role in co-ordinating manufacturing initiatives during the pandemic. As an example, the production of PPE and ventilators is often used for the need of local

supply. These actions show what is possible working together and there is a lot that can be learned from some of these initiatives. The Scottish Government for instance, played a key role in co-ordinating the manufacture of PPE. And as a result, went from a position of no PPE made in the UK being bought by the NHS before the pandemic to 80% being made in the UK. But this was extraordinary times – and the question now is can we use some of the learning and put this to good use in other areas.

Whilst there are many agencies and funds to support manufacturing firms, the UK landscape is complex and fragmented, with different pictures in the home nations, as well as regional differences in provision. Smaller companies in particular often do not have resources to do time intensive research and therefore do not access available support in the first place. We did hear some evidence where lockdown has actually made it easier for people to join networks and online events to access support and information that they normally wouldn't have the time to attend in person. Therefore, this could have a positive impact in terms of spreading the word and improving networks. We also witnessed examples of local recovery plans, for example in Scotland with their "Making Scotland's Future - recovery plan for manufacturing" where this "team", strong network approach plays a central role.

### *Working from home*

All interviewed businesses had at least some of their workforce working from home during the pandemic. Companies which had invested in technology before the pandemic were generally better prepared for the transition. Some proactive supply chains embraced the situation and fostered more virtual collaboration and data sharing whereas more traditional, less digital, companies struggled with collaboration.

In general, the attitude towards remote working is changing and most interviewees could see a more blended model of office and remote work where possible going forward. Whilst working from home wasn't a positive experience for all, for some the wins were in less time commuting, more productive working time, less travel to meetings and better for the planet with less cars on the road and planes in the air. For others they talked about different styles of working, "more authentic selves" and stronger relationships with colleagues as they saw a more relaxed person in their own homes.

### *Manufacturing Operations*

Many manufacturing businesses worked throughout lockdown, some were shut while they put in place social distancing and safety measures, some closed doors as there were no customers or orders. For some social distancing meant less people were allowed on site and lower output. Companies with high level of automation and fewer people actually on the shop floor found this easier.

We heard most people talk about Covid accelerating their digital journey, whether that be the adoption of simple communication technologies or more complex industrial digital technologies.

Limiting visitors on site did have an impact on some types of innovation, and also impacted maintenance and installation.

We heard the more progressive companies involving employees in innovation activities, whether that be collecting ideas how to make a safer working environment or actually involving them in business model design. We did hear a number of employers talk about some employees being afraid of coming to work, whilst other talked about the wellbeing of those working from home.

When talking about supply of goods, there was some stockpiling at the start of lockdown. But more recently we did hear a number of people talk about global shortages e.g. semi-conductors and packaging materials.

### *Brexit*

Given that we were carrying out our interviews in the period November 2020 to April 2021 it was unsurprising that most interviewees also wanted to talk about Brexit. And for some it was quite difficult to separate out the issues caused by the pandemic and those coming from Brexit. As discussed above, issues around movement of goods and supply were hard to unpick. We heard various stories of shortages of supply and delays in supply - in some cases the root cause might have been the pandemic but blamed on Brexit and vice versa.

## 3.2 Sectoral Findings

In this section we will pull out conversations and findings that appeared to be more common within certain groups or sectors. However, with a small sample, we are careful not to generalise too much.

### *Food & Drink*

Food & Drink manufacturers had very different experiences depending on their markets. With hospitality closed during lockdown consumption changed. Those who traditionally sold to hospitality had to make hard decisions. Some were able to sell into different markets, with some changing their business model completely and going for online models.

For those supplying supermarkets they tended to have better experiences – and with people spending more time at home sales of certain goods including biscuits, ice-cream and alcohol went through the roof. Indeed, panic buying led to some supply issues early in lockdown. There was talk of experiencing shortages particularly of packaging materials. Some of those interviewed felt the effects of Brexit had caused more problems than the pandemic. Brexit has been affecting exports and imports through more bureaucracy higher prices and in general operational risk.

Something the research team had not thought or seen reported was the uncertainty caused by the trade shows and fairs being cancelled. Smaller firms and new firms who used such events to find new markets were particularly hard hit by this. We saw some good examples of people setting up online stores and changing business processes to meet online demand. Smaller companies often built partnerships and served more local markets e.g. hampers and joint deliver services. Another problem we heard about during our interviews was problems limiting travel across regions which at points did stop or delay manufacturers getting plant and equipment installed, maintained and repaired. From the interviews it was clear that for many in food and drink they hadn't stopped manufacturing and had not had the same "time to think" as some of the other companies interviewed. Indeed, there was more "firefighting" reported.

### *Aerospace*

The aerospace industry was hit hard as travel more or less stopped. At the outset we had imagined we would find more problems than we actually did with smaller suppliers going out of business. To date we did not see this to the extent we expected. This could be partly to do with furlough keeping companies afloat. However, many of the big employers in the aerospace sector are international companies, serving international customers. And subsequently much of the supply chain is also international. This does raise the question of how entrenched these companies are in the UK and the worry is if some of them start to re-shore to their own shores.

New plane orders were cut dramatically so manufacture was cut dramatically as you would expect. But with some companies having moved to a more servitized "power by the hour" model this was also affected. For many the overhaul business was also influenced with flying hours down so radically. Another issue that was talked about in a number of interviews was the loss of skills, a major issue being the over 50s talking redundancy packages. Companies talked about using furlough, but also redundancies. Wages have tended to be higher in the aerospace sector. A lot of skilled people have left "leaving serious gaps which cannot be filled from one day to another". Furthermore, manufacturers are worried about the surviving of customers. As customers struggle financially, risk assessments are being carried out whether to continue manufacturing products for them.

### *Automotive*

The team only interviewed a handful of people involved directly with automotive manufacture, so we have less primary evidence from the interviews. Automotive was another sector where demand went through the floor. Showrooms were not able to open and people were not buying cars. With international supply chains there were also problems with international supply as some countries went into lockdown. After the initial stop of operations there was a real shortage of supply because the supply chains around the world were not operating or in some cases their supply (e.g. semiconductors) so large factories could not operate even though they were allowed to. However, we have not seen huge numbers of businesses shutting their doors.

## *Life Sciences*

Another sector where there was a vast range of experiences depending on the markets the manufacturer served. For some, those involved in anything to do with Covid treatment and prevention (sanitisers, ventilators, testing, vaccines etc), demand was so high. We heard stories of people working seven days a week for some time. We saw businesses where the pandemic actually created significant numbers of jobs. And there were lots of stories of innovation and new partnerships to get things done.

As with food and drink some manufacturers had found problems with getting equipment, and people travelling to do maintenance and repair. And there were stories of supply issues around commodities from overseas. The adoption of Covid safety protocols were just a small step for some companies because high hygiene measures were in place already. Some good stories of innovation – new products, new partnerships, and creation of complete supply chains (e.g. PPE and Respirator production).

### 3.3 Emerging Themes

#### *Innovation becoming an imperative*

Both the interviews and the survey told us that innovation was seen by nearly everyone as imperative going forward. During the registration process for an online event, we held with around 120 people in February we posed some questions and unanimously they told us that innovation had become more important, more talked about in their business and a central theme in their business going forward. What they meant by innovation may have been different in each company as we found during the interviews. For some it is about becoming slicker and more efficient in order to survive, for others it is about new markets, new products, new business models and new partnerships, and for some it is a complete change in direction.

#### *Accelerating digital uptake*

As we saw in the secondary research, a key theme from both the interviews and the survey was the pandemic accelerating the digital journey. We saw examples of interviewees talking about how investment pre-covid had made the transition to home working easier, others who talked about investment in technology helping deal with social distancing restrictions, and examples of things like VR helping with remote maintenance and commissioning.

#### *Changing the way we work*

People wanted to talk about the tangible differences in the way they work, about the transition to working from home, about issues of social distancing in the workplace and about the health and wellbeing of the workforce. Attitudes differed but many talked

about being more mindful of health and wellbeing and personal circumstances. We also heard stories of people building stronger relationships while working apart, often contrary to what was expected. Perhaps due to people being more authentic in their own homes, seeing inside colleague's homes and their families and pets!

### *Changes in supply chain*

This varied across the sectors, with less people talking about this in the aerospace sector. But within food and drink and life sciences people were talking about new partnerships. For some it was about working with local partners – we saw a lot of this within food and drink and some good examples as discussed earlier when talking about working together to solve a common problem e.g., PPE, hand sanitiser, ventilator challenge etc.

### *Reshoring*

This was something that came up in many interviews, but with some sectoral differences meaning we didn't elevate it to the generic theme. There was less talk of this when we analysed our interviews with people in the food and drink sector. Perhaps this was a sampling issue and because we spoke to more indigenous companies within this sector. Whilst politicians and the press often present reshoring as an opportunity, in the interviews we conducted it was seen more as a worry for those employed by companies with headquarters not in the UK.

### *People, skills and talent*

A considerable number of people we interviewed said they were worried about people, skills and talent in manufacturing going forward. Again, there were different conversations, with some concern about people leaving manufacturing, particularly the over 50s and the loss of years of experience. At the other end of the scale, others were worried about lockdown resulting in less people entering the sector including less apprentices, graduates, and young people. For those whose digital journey had been accelerated during the pandemic, they mentioned the new skills needed in a different working environment.

## **4. Discussion**

Manufacturing and associated supply chains are important for the UK. According to Make UK (2019), prior to the pandemic, the UK manufacturing sector employed 2.7 million people, accounted for 45% of total exports (totalling £275bn), represented 69% of business research and development (R&D) and provided 13% of business investment.

So, what impact has the Covid-19 pandemic had on UK manufacturing? It certainly has the potential of hitting manufacturing hard. At the outset of this project the researchers have expected to find many manufacturing companies shutting their doors, with the knock on effect of making entire supply chains vulnerable. However, the research team have been surprised by what they have found in the first six months of this project. So far, we have not seen a lot of evidence of this. Indeed, data suggests that there have been less bankruptcies in the past year than pre-pandemic. Furlough has indeed been a lifeline as many interviewees said. But that is not to say that we won't see these issues in the coming months, particularly once furlough ends. We know we have tough times ahead and some firms will not survive. This could in turn create gaps in UK supply chains, lessening the likelihood of attracting inward investment and threatening the future for some foreign owned manufacturing operations in the UK

Another thing that has surprised the research team is the number of positives that have emerged. Covid's impact on manufacturers has brought positive change, as well as disruption. Innovation has become the norm. We have already said we are seeing people buying locally –both in household spend and business to business. People are investing in their digital journey. As a result of lockdown, businesses and factory floors had to change and innovate at speed.

Networks are valued and people have made lasting partnerships and new collaborations.

We are also seeing obvious changes in our work patterns, less travel and commuting, good for the environment, well-being, and more sustainable futures.

## **5. Conclusions & next steps**

This paper presents real time findings from a live project. Like everything touched by the pandemic we are dealing with a very fluid situation and this report can only report on findings and data up to April 2021. What we can conclude is that manufacturing supply chains are heterogeneous and firms have been affected in different ways. While for many the effects have been negative, there are some manufacturers who have had positives resulting from Covid e.g., new partnerships, collaborations, business models, and new markets.

Whilst at this point in time, the picture has not been as bleak as the researchers thought back in the summer of 2020. It does look likely that there will be further job losses and firms closing. There could still be loss of important manufacturing and innovation capabilities. There was already concern that UK manufacturing was too reliant on an aging workforce. With so many job losses expected, it is likely that many of the older workforce will be the ones who exit organisations, leaving a further significant gap in capability. Whilst there is some research targeting the entrepreneurial implications of Covid19, there is a significant gap of how it has affected the perception of the need of innovation within manufacturing.

What we can say is everyone has been affected and things turned upside down. Disruption as always has led to innovation and people agree that innovation is going

to be important going forward. It has opened people's minds to working in different ways. Attitudes to technology have also changed, and for many digital journeys have been accelerated. Those who were further down the digital road at the start of the pandemic reaped the rewards. For some this was being able to communicate and share documents when working remotely, for others it was factory floor automation which made it easier to continue manufacturing with social distancing, for others it was the ability to carry out repairs and do commissioning using digital tools. The message for policy makers is that going forward it will be important to continue the digital journey and in particular encourage talent and skills to support manufacturers in the adoption of technology

Another theme we are hearing repeatedly is on-shoring, reshoring and a general desire to be less reliant on overseas supply chains. This could be an opportunity for UK manufacturing. But given this is likely to be the same the world over, and the number of big manufacturing employers who are not UK companies, this is also a significant risk.

The pandemic has pushed many companies to reconsider their future. For some this has been about surviving in the short term, for others it has been about rethinking the business model and strategy in the longer term.

Going forward, the researchers plan to carry out an in-depth analysis of innovation capability in particularly vulnerable supply chains. What has become clear is how important innovation is going to be to UK manufacturing going forward and coming back stronger. In the coming months our project will look at how we can support each other to develop innovation capability – it's not a one size fits all – but rather identifying some common areas where companies need support.

With so many uncertainties for manufacturing going forward the research team are going to use future scenarios to generate a conversation around the future of manufacturing. This tool will allow us to understand the drivers and uncertainties of the industry to build possible pictures of the future. We will start with a pilot study looking at the future of manufacturing in Scotland.



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## Further Reading

### *Manufacturing recovery plans*

- <https://www.makeuk.org/insights/publications/manufacturing-our-road-to-recovery> (Make UK)
- <https://www.manufacturing-recovery.co.uk/>

### *Sectoral Reports*

- <https://www.accountingweb.co.uk/business/finance-strategy/car-industry-in-spin-as-covid-19-and-brex-it-bite> (automotive)
- <https://oilandgasuk.co.uk/oguk-report-offers-first-insight-into-impact-of-pandemic-on-offshore-jobs/> (oil & gas)
- <https://www.strategyand.pwc.com/de/de/implications-of-covid-19/consequences-for-the-chemicals-industry.html>
- <https://www.fticonsulting.com/insights/articles/impacts-brex-it-chemicals-industry>
- <https://www.theengineer.co.uk/manufacturing-a-national-economic-recovery/>

### *Supply Chain and reshoring*

- <https://www.themanufacturer.com/articles/reshoring-manufacturing-coming-home/>
- <https://www.themanufacturer.com/articles/beyond-covid-19-building-supply-chain-resilience/>
- <https://www.themanufacturer.com/articles/disruption-now-springboard-innovation-manufacturing/>
- <https://www.ft.com/content/2ed34037-af26-497c-9341-84fc635731a2> (supply challenges).

### *Insolvency*

- <https://www.gov.uk/government/statistics/individual-insolvency-statistics-january-to-march-2021/commentary-individual-insolvency-statistics-january-to-march-2021>

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INNOVATION AND PRODUCTIVITY GROWTH Chander Velu Yifeng (Philip) Chen (University of Cambridge)

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*Other useful sources*

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- <https://www.mckinsey.com/business-functions/marketing-and-sales/our-insights/survey-uk-b2b-decision-maker-response-to-covid-19-crisis>
- <https://cep.lse.ac.uk/new/publications/abstract.asp?index=7291>
- [https://www.ifm.eng.cam.ac.uk/uploads/Research/BMI/Cambridge\\_BMI\\_Working\\_Papers\\_01\\_2021.pdf](https://www.ifm.eng.cam.ac.uk/uploads/Research/BMI/Cambridge_BMI_Working_Papers_01_2021.pdf)
- <https://cep.lse.ac.uk/pubs/download/cepcovid-19-009.pdf>
- <https://www.themanufacturer.com/articles/brexit-covid-19-uncertainty-weigh-heavy-sme-manufacturers-recovery/>
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