

## Midlands Engine Observatory Academic Insights

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*Document Version*

Publisher's PDF, also known as Version of record

*Citation for published version (Harvard):*

Lyons, M, Ortega Argiles, R & Ehsan, S 2022, *Midlands Engine Observatory Academic Insights: The Economic Impact of Brexit and Covid-19 on the Midlands Automotive Sector*.

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# MIDLANDS ENGINE OBSERVATORY ACADEMIC INSIGHTS

## The Economic Impact of Brexit and Covid-19 on the Midlands Automotive Sector

### Theme:

The automotive supply chain has seen a significant impact from Brexit and the Covid-19 pandemic.

### Area of Focus:

Understanding the economic impact of Brexit and Covid-19 on the automotive sector in the Midlands. Economic modelling techniques are used to determine the impact in terms of output, GVA and employment.

### Key Findings:

- The economic impact of the combined Brexit and Covid-19 shock is likely to have very significant impacts on the automotive sector resilience. However, differentiating the impact of Covid and Brexit is challenging.
- The economic impact is assessed under three hypothetical scenarios. Under the realistic scenario a -19% shock to the automotive sector would see **48,845 jobs**, **£8.7 billion** output and **£4.5 billion** GVA lost in the Midlands.
- The economic impact is felt most acutely in the Midlands and North West regions where the automotive sector is clustered. However, the South East and East of England are also (indirectly) impacted.
- The fall in output in the automotive sector negatively spills over related industries notably, fabricated metals, manufacturing sectors, engineering and professional services.
- Policymakers must prepare now for future shocks such as the combustion engine ban to improve resilience in the region and achieve 'levelling up' in the long-term.



### **Midlands Engine Impact:**

- The automotive sector is an important part of the economy in the Midlands with 40% of all new cars exported from the UK made in the West Midlands.
- Covid-19 and Brexit have significantly impacted the automotive sector with new car production down 29.3% in 2020 from 2019 levels.
- The concentration of automotive activity in the Midlands raises concerns that the economic impact of Covid-19, and potentially Brexit, is likely to have an outsized impact on the region.

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# The Economic Impact of Brexit and Covid-19 on the Midlands Automotive Sector

City-REDI/WM-REDI has prepared this brief to provide insight into the economic impact that Brexit and Covid-19 pandemic have had on the automotive sector in the Midlands during 2020. The research uses City-REDI's SEIM-UK economic model to estimate the economic impact in terms of output, GVA and employment. The estimates show the intersectoral and interregional impacts derived from these shocks at the NUTS 1 geographical level.

## Context

The automotive industry is an important part of the UK national economy. The automotive industry is one of the UK's major employers, supporting over 800,000 jobs ([SMMT, 2021](#)). Automotive is estimated to be worth £78.9 billion in turnover and £15.3 billion in GVA in 2019 ([SMMT, n.d](#)). However, the automotive sector has seen significant growth from 2008 to 2016 weakening since 2016 ([ONS, 2020](#)).

The automotive sector is one of the most important sectors to the Midlands economy, constituting a vital driver of its competitive advantage. The automotive sector is a significant employer in the Midlands, with 50,575 people employed (FTE) in the automotive 66,905 when the broader sector is considered (see figure 1). In 2019, 35 per cent of all UK's automotive employment was in the West Midlands (ONS, 2021). The automotive sector is considered an export intensive sector, and the West Midlands is the UK's leading region making 40 per cent of all cars exported from the UK ([WMGC, n.d](#)). The Midlands is home to 430 specialist automotive firms and some of the market leaders, including Jaguar Land Rover and Aston Martin Lagonda. The automotive sector is broad with strong linkages to metals, engineering, R&D and other advanced manufacturing sectors.

Both Covid-19 and Brexit implementation have disrupted production, demand and trade for industries throughout the automotive supply chain. SMMT figures show that new car production is down -29.3% in 2020 and 28.7% in 2021 compared to 2019 ([SMMT, 2021](#) and [SMMT, 2022](#)). Representing the lowest levels of car production since 1984. The reasons for this fall in output are found both on the supply-side and demand side. In 2020, multiple automotive firms saw plant closures at large firms ([BBC, 2020](#)). The causes of the plant closures were threefold. Firstly, related to health with employers required to help reduce the spread of infection. Secondly, supply chain interruptions were caused due production closures in China and elsewhere in the world. Thirdly, due to a significant decline in demand.

Research by [WMREDI](#) (Qamar et al., 2020) revealed that 21 large manufacturing firms in the automotive sector are at high risk due to relatively poor liquidity ratios. The outsized automotive sector in the West Midlands and the sector's vulnerability has raised concerns that the region may be one of the hardest hit by Covid-19 ([The Guardian, 2020](#)).

## Economic Impact Assessment

The Socio-Economic Impact Model for the UK (SEIM-UK) is a multi-regional input-output (MRIO) built in City-REDI. The SEIM-UK shows a complete picture of the flows of goods and services in the UK economy over one year. Analytical tables can be derived from the underlying multi-regional input-output table from which multipliers can be generated. Multiplier effects show the indirect, knock-on regional impacts due to changes in the UK's domestic

economy. For example, in the automotive sector, an increase in its final demand, will have to be translated into an increase of its production to meet the new higher demand level. The increase in production in the automotive sector will require suppliers to the automotive sector, such as raw material suppliers, to increase their production to meet the new level of higher demand for their goods and services. Multipliers are, therefore, a useful tool for evaluating the total impact of a positive or negative shock to the economy.

The SEIM is designed to reveal geographic as well as sectoral shocks covering 30 economic sectors, 12 NUTS 1 and 41 NUTS 2 UK regions. The SEIM provides highly detailed place-sensitive analysis that serves sub-national policymaking communities.

Prior to any economic impact assessment, the automotive sector must be defined, the geographies of focus identified, and the shock scenarios detailed. In this briefing, the automotive sector has two definitions, one narrow, one broad (see Figure 1). The narrow definition of the automotive sector includes only activities directly related to the production of vehicles and parts. The broadly defined automotive sector expands the narrow definition to include backwards linkages in metals and engineering.

Figure 1. Defining the automotive sector with Standard Industrial Classification codes (2007).

Automotive				Metals		Engineering	
2910: Manufacture of motor vehicles	29201 : Manufacture of bodies (coachwork) for motor vehicles (except caravans)	2932: Manufacture of other parts and accessories for motor vehicles	2931: Manufacture of electrical and electronic equipment for motor vehicles	24 : Manufacture of basic metals	25 : Manufacture of fabricated metal products, except machinery and equipment	71121 : Engineering design activities for industrial process and production	7120 : Technical testing and analysis
Narrow definition				Broad definition			

The automotive sector is distributed across the UK, with one in every fourteen employed in manufacturing being automotive employees nationwide ([SMMT, 2021](#)). However, the concentration is as high as one in six in the North East and the West Midlands. This study will focus on the four biggest clusters of automotive employment in the UK: The North East, North West, West Midlands and the East Midlands (Table 1). Together, the four regions accounted for around 62 per cent of automotive employment in 2019 (ONS).

Disentangling the economic impact of Covid-19 throughout the UK economy in 2020 is challenging due to the concurrent economic impacts associated with Brexit. Given the high degree of uncertainty that surrounds these shocks, our estimates use six different scenarios (Table 1). The scenarios constructed are from -14 per cent (optimistic) -19 per cent (realistic) to -28 per cent (pessimistic).

Table 1. The six demand shock scenarios from optimistic to pessimistic for the narrowly defined automotive sector (Auto) and the broader definition (broad) in four NUTS 1 regions.

	-14%		-19%		-28%	
	Auto	Broad	Auto	Broad	Auto	Broad
North East - UKC North West - UKD West Midlands-UKG East Midlands UKF	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6

Shock severity 

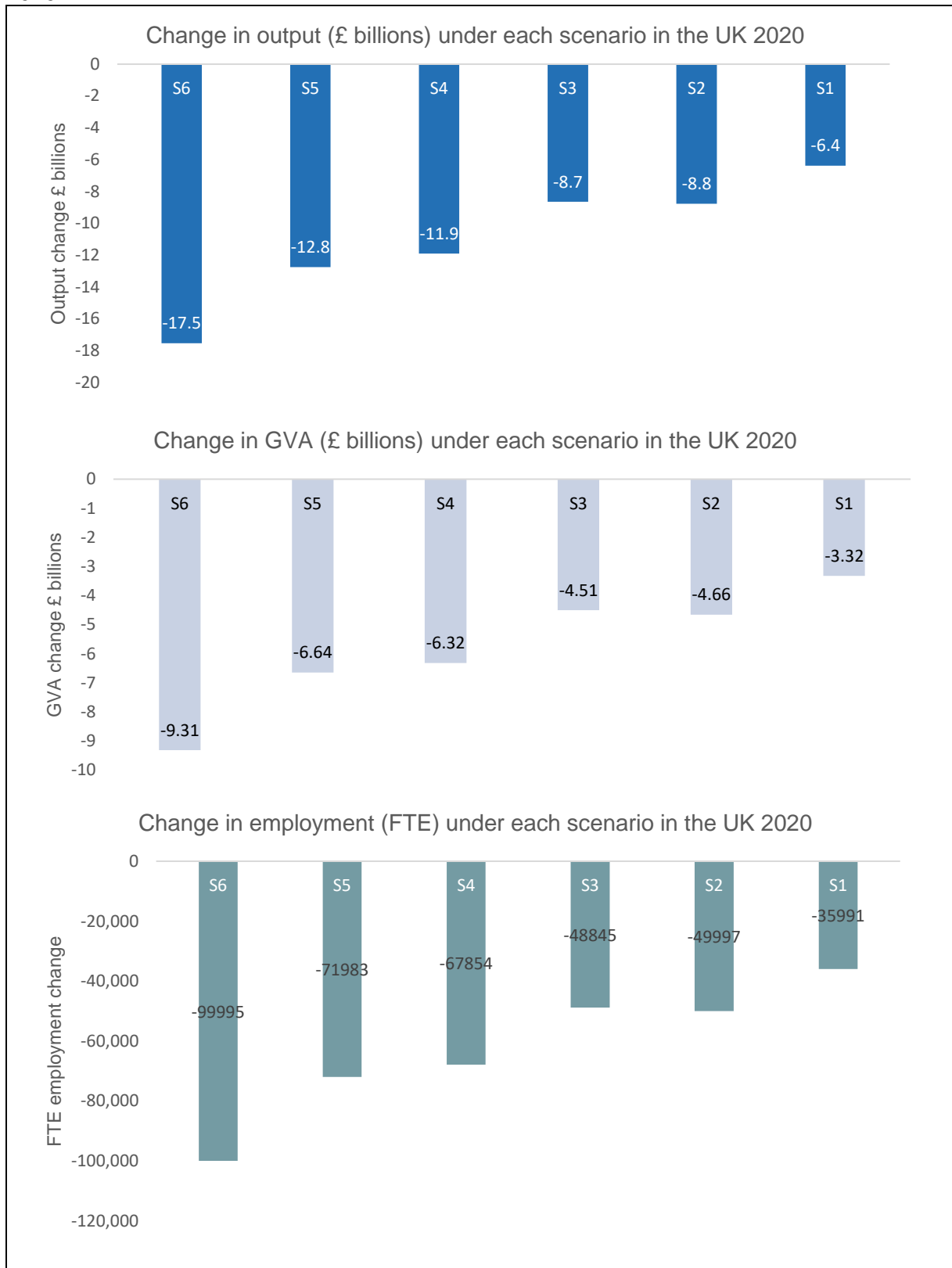
To estimate the economic shocks triggered by these six scenarios, we use a hypothetical extraction method (HEM). HEM involves the extraction of sales and purchases made by a sector from the economic model (SEIM-UK). With the sector extracted, the new smaller hypothetical economy can be compared with the original model to determine the extent of the economic shock.

## The Economic Impact of Covid-19 and Brexit on UK's Automotive Sector

### UK impacts

The impact of each of the six scenarios on the whole UK economy are illustrated in Figure 2. Under scenario 1, the **most optimistic demand scenario** on the narrowly defined automotive sector sees output fall by £6.4 billion, GVA by £3.32 billion and FTE by 35,991. In scenario 6, the **most pessimistic demand scenario** on the broadly defined automotive sector sees output fall by £17.5 billion, GVA by £9.31 billion and FTE by 99,995. These scenarios, therefore, represent a broad range of the potential impacts of Covid-19 and Brexit on the UK economy. In percentage terms, the output impact ranges from -0.18% to -0.50% and in employment -0.12% to -0.33%. Such impacts are relatively minor at the national level and fail to communicate the significance of the regional impact of the crisis.

Figure 2. The six impact scenarios on output, GVA and FTE employment at the UK level in 2020.

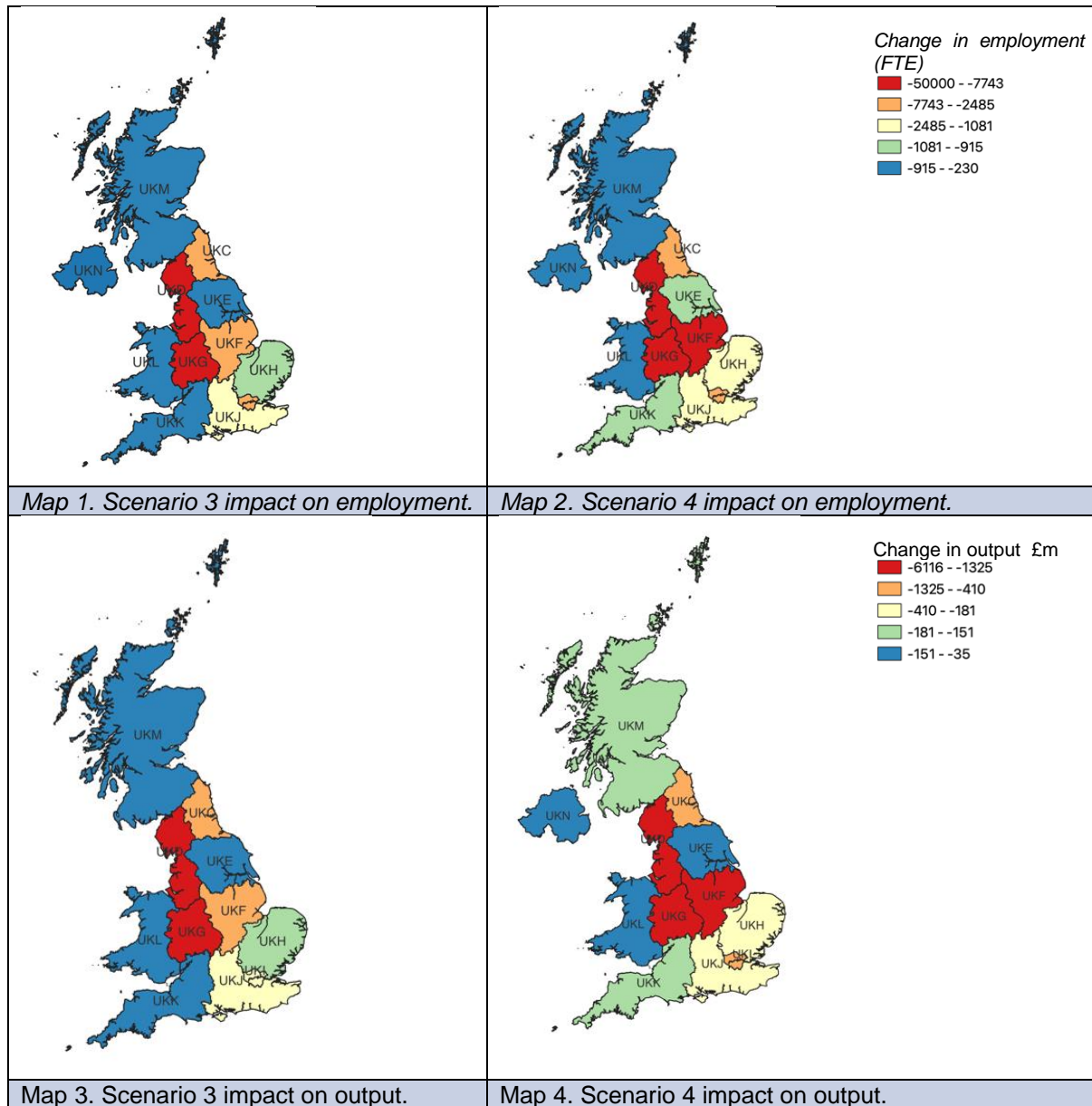


## Interregional Impacts

An economic shock to the automotive sector in one region will spill over into other regions due to the interconnectedness of industries across the UK. This analysis allows us to understand how a negative shock in the major hubs of automotive sector activity can ripple out across UK regions.

Table 2 details a 19 per cent drop in automotive sector demand for the four NUTS regions (West Midlands, East Midlands, North East and North West). The maps on the left show the impacts on the narrowly defined automotive sector while the maps on the right show the broader automotive cluster. The maps on the top show the change in employment due to the changes in demand by geography while the maps on the bottom show the changes in output.

Table 2. Interregional impacts of the shock scenarios on the automotive sector.



Comparing maps 3 and 4, we can see the change between a focus on the narrow and broader automotive sector. The broader sector sees a greater fall in output, affecting broader geography.

Looking between maps 1 and 3, we can see a broadly similar pattern between changes in employment and changes in output. Scotland, Wales, Northern Ireland and the South West and Yorkshire and the Humber are all grouped in the lowest impact categories. While the worst affected areas in terms of output and employment loss are found to be West Midlands and the North West. This is expected as they are the regions with the largest share of automotive sector employment (35% and 12%, respectively).

The impact of Covid-19 and Brexit shocks in the automotive sector is, therefore, relatively much more acute in the West Midlands than in the rest of the UK. At the UK level, the drop in annual output is estimated between -0.18% to -0.50% compared with -1.24% to -3.3% in the West Midlands. In the East and West Midlands together, it represents around 63% of the UK's output lost estimate. In FTE terms, the Midlands is estimated to lose between 14,948-68,548 FTE approximately 42-69% of the UK total FTE lost.

Table 3 details the change in output by region based on the best- and worst-case scenarios (full table in appendix). Outside the directly shocked regions we can see the spill over into other regions in the UK. Wales is notably the most significantly impacted followed by the East and South East of England. However, even Scotland and Northern Ireland feel the impact of the lost output.

*Table 3. Output change % best vs worst case scenarios by NUTS 1 region.*

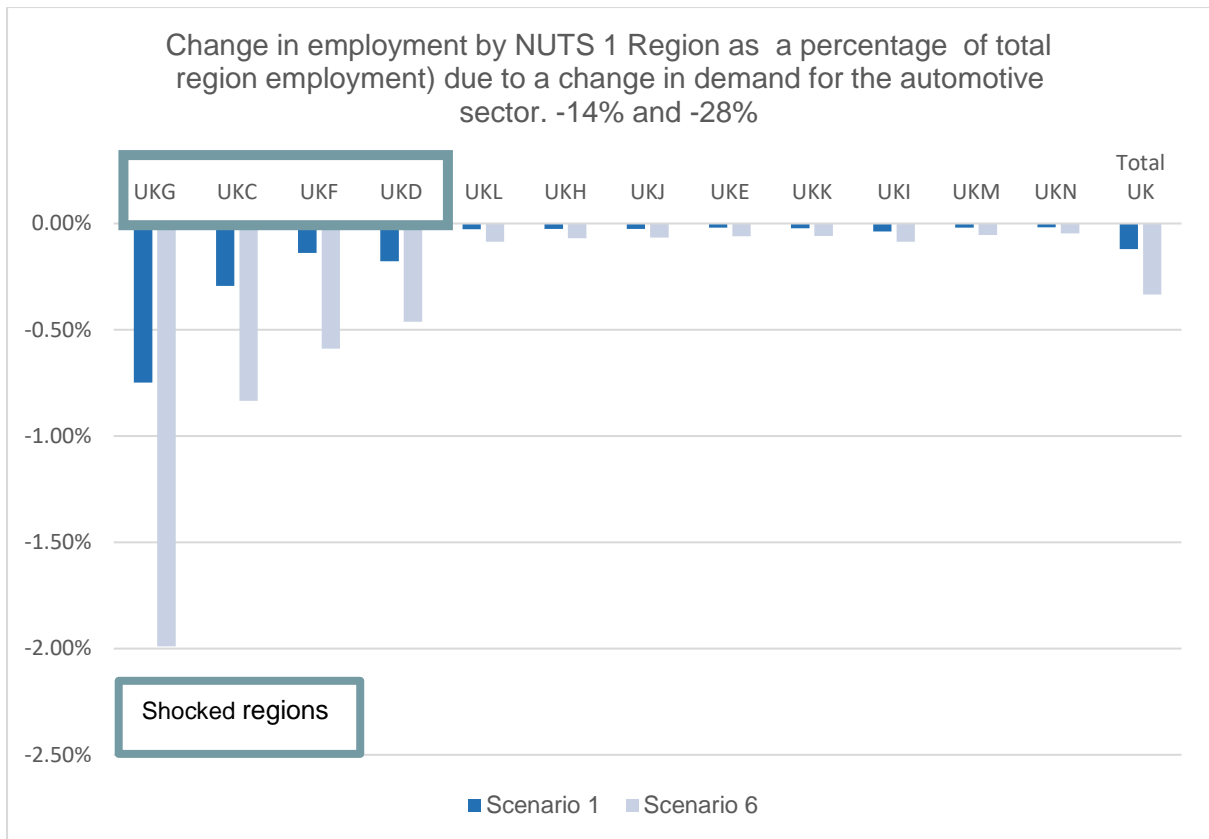
<b>NUTS 1 Region</b>	<b>Scenario 1 Output change %</b>	<b>Scenario 6 Output change %</b>
<i>UKG West Midlands</i>	-1.24%	-3.30%
<i>UKC North East</i>	-0.54%	-1.41%
<i>UKF East Midlands</i>	-0.24%	-0.98%
<i>UKD North West</i>	-0.29%	-0.74%
UKL Wales	-0.05%	-0.15%
UKH East of England	-0.04%	-0.10%
UKJ South East	-0.04%	-0.10%
UKE Yorkshire and the Humber	-0.03%	-0.09%
UKK South West	-0.03%	-0.09%
UKI London	-0.04%	-0.09%
UKM Scotland	-0.03%	-0.09%
UKN Northern Ireland	-0.02%	-0.07%
<b>Total UK</b>	<b>-0.18%</b>	<b>-0.50%</b>

*Shocked regions in italics*

The change in employment by region follows a similar pattern. Figure 3 shows within the shocked regions again the West Midlands (UKG) sees the biggest impact with a loss of FTE between -0.75% and -1.99% throughout the economy. Once more we can see that no region is unaffected by the shock.

*Figure 3. Change in employment by NUTS 1 Region (as a percentage of total region employment) due to a change in demand for the automotive sector. -14% and -28%.*

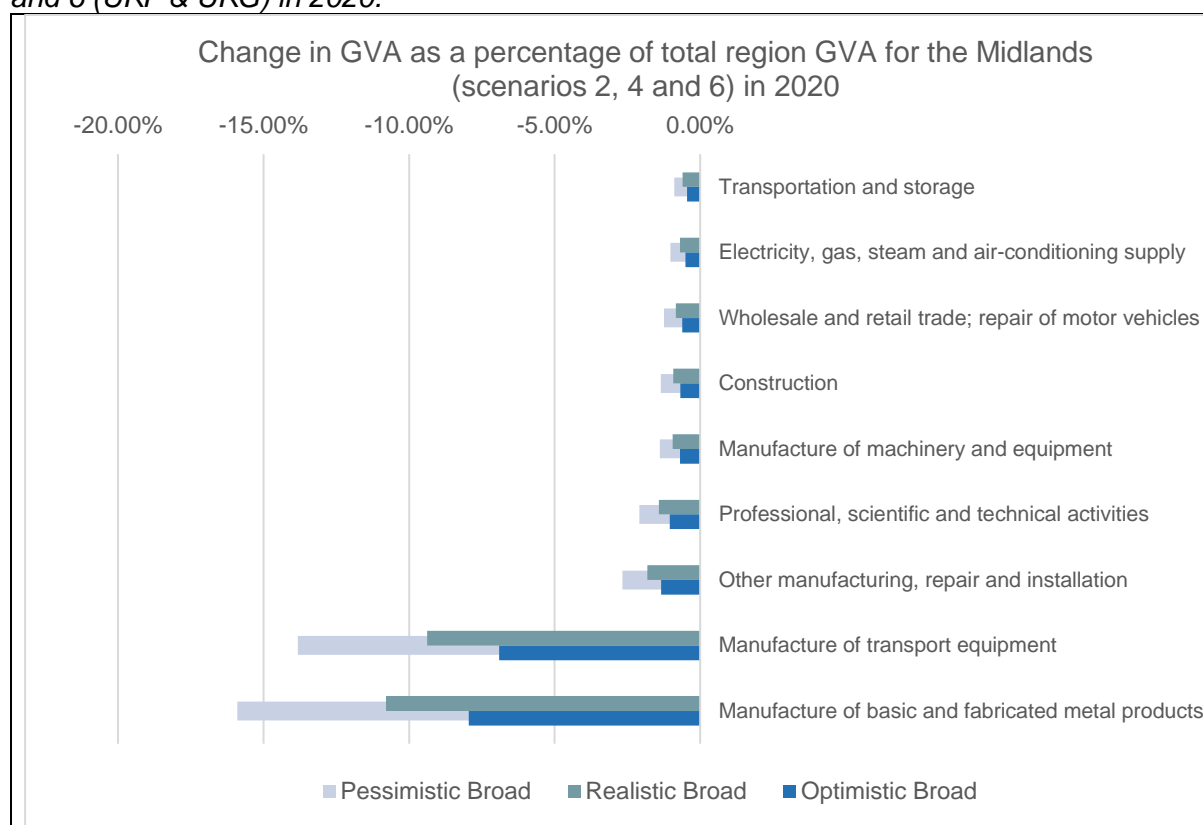




## Interindustry Impacts

Figure 4 shows the supply chain effects of the three different demand shocks (-14%, 19% and -28%) on the broad automotive cluster in the Midlands. Unsurprisingly the most vulnerable sectors are the manufacture of vehicles and fabricated metals. Under the most severe economic scenario (-28%) manufacture of basic and fabricated metal products observes a 16% fall in GVA compared with an 8% fall in the least severe scenario. Outside of the shocked sectors (see figure 1), the spill-over impacts are in the broader manufacturing sectors, professional and technical services, construction, trade of motor vehicles, electricity, transportation and storage.

Figure 4. Interindustry impacts of the three broadly defined auto sector shock scenarios 2, 4 and 6 (UKF & UKG) in 2020.



## What Does this Analysis Mean for Policy?

This report has provided some estimates of Covid-19 and Brexit's economic impact on the UK regional economies. The economic picture described suggests the Midlands and particularly the West Midlands will see a significant economic shock with, under the worst-case scenario (scenario 6), a loss of around £9.01 billion output, £4.58 billion in GVA and 49,804 FTE jobs.

The estimated impact scenarios suggest a broad range of possible impacts. This is due to uncertainty and the difficulty of disentangling the concurrent shocks of Brexit, systemic supply chain issues and Covid-19 policy interventions.

The Delta and subsequent Omicron variants have shown that the Covid-19 pandemic is not yet over. The immediate impacts of Covid-19 are very well understood by the population as well as the analysts (McCann and Ortega-Argiles, 2021). However, the uncertainty of the future of Covid-19 and the knowledge that future pandemics 'could be worse' (BBC, 2021) means that evaluating the regional economic and labour impact of such shocks is important for future policy decisions such as implementing further lockdowns. The lockdowns which have been instituted by a multitude of countries mean that the global demand for many final goods and services has collapsed and many international supply chains (or more precisely global value-chains) have been stalled. The pandemic has affected places and regions in a very different way, while online services have seen their share prices soared, advanced manufacturing in areas not connected with medical, bioscience or pharmaceutical have seen their productions heavily affected. This evaluation has illustrated what regional resilience to the pandemic looks like in terms of regional output (percentage of total regional GVA) in regions with a dominant automotive manufacturing cluster.

Our analysis has shown that the contractions linked with value chain shocks have to be taken seriously and that the degree of severity will differ between places, depending on their

economic structures and also the ways in which governments have responded to it. The briefing has reasserted how important the automotive manufacturing sector remains to the Midlands economy. The sector is facing multiple crises, and the lack of resilience in the Midlands and North of England has been further evidenced. Major UK employers in sectors such as aerospace, automobiles, transportation and retail announced widespread redundancies and high number of firms dissolving (Prashar et al., 2020).

Our evidence is part of an emerging evidence that points to the economically weaker regions to the UK being the most adversely affected by the coronavirus shock (Innes et al., 2020; Scott, 2020, among others) and the Brexit shock (Chen et al., 2018; Thyssen et al., 2020, among others). In contrast, the services sectors of London are likely to be the least affected sectors in the medium and long term (Davenport et al. 2020). If the UK government is to achieve levelling up, regions and sectors outside of London and the South-East must be supported proportionately.

The automotive sector is facing significant change over the next decade. Diesel and petrol engines are being phased out with a ban on new combustion engines from 2030 in the UK (BBC, 2020a). The supply chains for alternative propulsion engines may be significantly different to the status quo leading to further uncertainty in the future regional automotive sector. For policy, this means regions like the Midlands will have to recalibrate their labour markets with the help of universities in preparation for demand for new skills and technologies (Collinson, 2021).

## Summary

This policy brief shows that while there is uncertainty surrounding the economic impact of Covid-19 and Brexit on the automotive sector in some regions, the impact in 2020 is likely to have been severe. Concurrent issues of Brexit, microchip shortages and Covid-19 policy interventions like the furlough scheme complicate impact assessments. However, the results show that for the Midlands and the North of England, a sizable chunk of the automotive ecosystem is at risk. The supply chain linkages in the automotive sector are mostly in transportation and manufacturing but also elements of retail, professional services, energy and construction.

The characterization of the automotive sector for the SEIM-UK means that potential future positive shocks can be evaluated. Future research may explore the potential economic impacts of West Midlands' leading role in connected autonomous vehicles (CAVs), battery propulsion and future mobility.

## Research Team

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## Appendix. Scenario model outputs

This table shows how output and employment will change under each demand shock scenario.

	Scenario 1			
	Output change £ m	Output change %	FTE change	FTE change %
<b>Total UK</b>	<b>-6378</b>	<b>-0.18%</b>	<b>-35991</b>	<b>-0.12%</b>
UKC North East	-587	-0.54%	-3036	-0.29%
UKD North West	-1010	-0.29%	-5742	-0.18%
UKE Yorkshire and the Humber	-68	-0.03%	-459	-0.02%
UKF East Midlands	-497	-0.24%	-2847	-0.14%
UKG West Midlands	-3389	-1.24%	-18743	-0.75%
UKH East of England	-111	-0.04%	-689	-0.03%
UKI London	-284	-0.04%	-1893	-0.04%
UKJ South East	-188	-0.04%	-1071	-0.03%
UKK South West	-85	-0.03%	-549	-0.02%
UKL Wales	-61	-0.05%	-345	-0.03%
UKM Scotland	-81	-0.03%	-492	-0.02%
UKN Northern Ireland	-18	-0.02%	-126	-0.02%
	Scenario 2			
	Output change £ m	Output change %	FTE change	FTE change %
<b>Total UK</b>	<b>-8769</b>	<b>-0.25%</b>	<b>-49997</b>	<b>-0.17%</b>
UKC North East	-763	-0.70%	-4321	-0.42%
UKD North West	-1264	-0.37%	-7494	-0.23%
UKE Yorkshire and the Humber	-111	-0.05%	-702	-0.03%
UKF East Midlands	-1030	-0.49%	-6051	-0.29%
UKG West Midlands	-4506	-1.65%	-24902	-1.00%
UKH East of England	-159	-0.05%	-935	-0.03%
UKI London	-331	-0.04%	-2130	-0.04%
UKJ South East	-259	-0.05%	-1381	-0.03%
UKK South West	-113	-0.04%	-704	-0.03%
UKL Wales	-91	-0.07%	-540	-0.04%
UKM Scotland	-116	-0.04%	-668	-0.03%
UKN Northern Ireland	-26	-0.03%	-169	-0.02%

<b>Scenario 3</b>				
	Output change £ m	Output change %	FTE change	FTE change %
<b>Total UK</b>	<b>-8657</b>	<b>-0.25%</b>	<b>-48845</b>	<b>-0.16%</b>
UKC North East	-796	-0.73%	-4121	-0.40%
UKD North West	-1370	-0.40%	-7792	-0.24%
UKE Yorkshire and the Humber	-92	-0.04%	-623	-0.03%
UKF East Midlands	-675	-0.32%	-3864	-0.19%
UKG West Midlands	-4600	-1.68%	-25438	-1.02%
UKH East of England	-151	-0.05%	-935	-0.03%
UKI London	-385	-0.05%	-2569	-0.05%
UKJ South East	-256	-0.05%	-1453	-0.04%
UKK South West	-115	-0.04%	-745	-0.03%
UKL Wales	-82	-0.07%	-468	-0.04%
UKM Scotland	-110	-0.04%	-667	-0.03%
UKN Northern Ireland	-25	-0.03%	-171	-0.02%
<b>Scenario 4</b>				
	Output change £ m	Output change %	FTE change	FTE change %
<b>Total UK</b>	<b>-11901</b>	<b>-0.34%</b>	<b>-67854</b>	<b>-0.23%</b>
UKC North East	-1035	-0.95%	-5865	-0.57%
UKD North West	-1716	-0.50%	-10170	-0.31%
UKE Yorkshire and the Humber	-150	-0.06%	-952	-0.04%
UKF East Midlands	-1398	-0.66%	-8212	-0.40%
UKG West Midlands	-6116	-2.24%	-33796	-1.35%
UKH East of England	-216	-0.07%	-1270	-0.05%
UKI London	-449	-0.06%	-2891	-0.06%
UKJ South East	-351	-0.07%	-1874	-0.05%
UKK South West	-153	-0.06%	-955	-0.04%
UKL Wales	-124	-0.10%	-732	-0.06%
UKM Scotland	-158	-0.06%	-906	-0.04%
UKN Northern Ireland	-35	-0.05%	-230	-0.03%
<b>Scenario 5</b>				
	Output change £ m	Output change %	FTE change	FTE change %
<b>Total UK</b>	<b>-12757</b>	<b>-0.36%</b>	<b>-71983</b>	<b>-0.24%</b>
UKC North East	-1174	-1.08%	-6073	-0.59%
UKD North West	-2020	-0.59%	-11483	-0.35%
UKE Yorkshire and the Humber	-136	-0.06%	-918	-0.04%
UKF East Midlands	-994	-0.47%	-5694	-0.28%

UKG West Midlands	-6778	-2.48%	-37487	-1.50%
UKH East of England	-222	-0.07%	-1378	-0.05%
UKI London	-567	-0.07%	-3785	-0.08%
UKJ South East	-377	-0.07%	-2142	-0.05%
UKK South West	-169	-0.07%	-1097	-0.05%
UKL Wales	-122	-0.10%	-690	-0.05%
UKM Scotland	-162	-0.06%	-983	-0.04%
UKN Northern Ireland	-36	-0.05%	-252	-0.03%
	<b>Scenario 6</b>			
	Output change £ m	Output change %	FTE change	FTE change %
<b>Total UK</b>	<b>-17538</b>	<b>-0.50%</b>	<b>-99995</b>	<b>-0.33%</b>
UKC North East	-1525.21	-1.41%	-8643	-0.83%
UKD North West	-2528.48	-0.74%	-14987	-0.46%
UKE Yorkshire and the Humber	-221.13	-0.09%	-1403	-0.06%
UKF East Midlands	-2059.97	-0.98%	-12102	-0.59%
UKG West Midlands	-9012.41	-3.30%	-49805	-1.99%
UKH East of England	-317.81	-0.10%	-1871	-0.07%
UKI London	-661.93	-0.09%	-4261	-0.09%
UKJ South East	-517.66	-0.10%	-2762	-0.07%
UKK South West	-225.59	-0.09%	-1408	-0.06%
UKL Wales	-182.45	-0.15%	-1079	-0.09%
UKM Scotland	-232.91	-0.09%	-1335	-0.05%
UKN Northern Ireland	-52.20	-0.07%	-338	-0.05%