### **Productivity in the West Midlands**



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### **Executive summary**

This report aims to shed greater understanding of labour productivity in the West Midlands government office region and the areas within it. Productivity growth can allow for higher incomes and improved living standards and so it is central to levelling up the region. The findings of this paper should help guide policy makers to policy areas that are most likely to drive productivity growth in the West Midlands.

As is usual, labour productivity data is far from perfect -particularly at the sub regional level. Whilst these are unlikely to significantly change the broad findings it does mean the findings should be treated with a degree of caution.

Productivity gaps across countries and within regions is not uncommon, but the variation within the UK is high compared to international standards. In the West Midlands GOR, labour productivity was 11% below the UK in 2019, and 33% lower than the most productive region (London).

The West Midlands has one of the largest inter-regional gaps in productivity. With its most productive subregion (Solihull) producing £21.50 (47%) per hour more than its least productive subregion (County of Herefordshire). At ITL3 level, only 3 subregions in the wider West Midlands had labour productivity levels above the UK average in 2019 (even when London is excluded from the average); Solihill was the highest (£45.20 per hour), followed by Warwickshire (£37.40 per hour) and Coventry (£36.20 per hour).

And productivity growth in the West Midlands (+£8.85 between 2004-2019) was slightly lower than the UK average (+£9.74), meaning it's relative position to the UK worsened slightly.

The productivity growth that has occurred has been unevenly spread across the West Midlands – the areas with the highest productivity in 2004 also saw the greatest growth. Solihull had the largest growth (+£15.40 between 2004-2019) and the eighth largest growth in the UK. Meanwhile, Wolverhampton had the lowest growth in the region (+£3.80) and the second lowest growth across UK subregions.

The ONS have produced analysis looking at how much of the regional gaps in labour productivity can be explained by these differences in the industrial structures across regions and how much is due to differences at the firm-level. Unfortunately, the analysis is based on 2015 data but many of its conclusions are likely to remain relevant today. The analysis suggests the industry structure of the West Midlands plays a positive role in its labour productivity, but not enough to offset the low average plant productivity.

At a subregional level, however, Hertfordshire, Worcestershire & Warwickshire are some of a handful of places where the industry structure has a more significant effect on aggregate productivity than firm-level productivities. And both the industry structure and plant productivity have a positive effect on relative productivity.

Local plant productivity in the West Midlands' Less Knowledge Intensive Services (LKIS) is the most widely spread. And median productivity in these sectors (£25,110 per worker) is more than half that in the Knowledge Intensive Services (KIS, £55,430) and the Medium/High Tech Manufacturing (MHTM, £57,190).

Given the size of the LKIS sector (making up over half of the local plants in the West Midlands and accounting for nearly 60% of employment) it is important in explaining the aggregate productivity gap. In fact, over 9 in 10 plants in the bottom 20% of the productivity distribution in the West Midlands were in the LKIS sector.





On the other hand, plants in the 'other' sector (composed of primary and utilities, real estate and construction) play a significant role in the upper quintile of the productivity distribution in West Midlands (40%), despite making up on only one in six (16%) of all plants in the region. In contrast, London and the South East, which have productivity above the UK average, have the top 20% of the productivity distribution dominated by plants in the KIS.

Plant productivity may also be linked to the size and age of the firm it belongs to. For example, a small store of a large supermarket chain may benefit from more efficient administrative systems or large supply chains (hence a cost advantage) compared with a standalone similar store. Equally older firms may have greater experience and networks that allow them to operate more effectively than younger, newer firms still learning the market. However, the impact of age and size may simply be attributable to their dominance in certain industries - plants of larger and older firms may be more prevalent in naturally more productive sectors.

In the West Midlands, micro firms (with 1-9 employment) have the highest *median* productivity and are most concentrated in the more productive KIS and 'other' sectors. Consequently, they have a higher representation in the upper quintile of the productivity distribution. However, plants of larger firms have higher *average* productivity driven by a long top tail.

Younger firms are also more concentrated in the KIS whilst older firms in the West Midlands are more concentrated in the manufacturing and LKIS sectors. However, the median productivity of plants belonging to firms under 20 years old shows little variation. And whilst firms aged 20+ have the lowest median productivity their long top tail drives up their mean productivity.

In general, whilst there are some variations in productivity by enterprise age and size across regions these are small. As such, differences in age and firm size explains, at best, only a small part of West Midlands' productivity gap.



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### **Report purpose**

This report focuses on bringing together readily available ONS data to better understand the labour productivity gap in the West Midlands.

### **Definitions and data issues**

### **Productivity**

Productivity measures the value of what is produced per unit of input. Inputs are essentially what is used to produce the output. They can be grouped into 3 broad categories:

- labour (which can be split into labour composition (measuring the quality of labour including education and experience) and labour input (in terms of hours worked)),
- capital (including equipment, machinery, offices or factories), and
- 'other' (which includes fabrics or materials, energy, purchased services (such as accounting or legal services brought in)).

Productivity can be measured against labour and capital inputs plus a residual (which cannot be attributed to any one input alone – this is known as multi-factor productivity).

This report focuses on **labour productivity** – which measures how much output is produced per unit of labour input. There are varying measures of labour input, determined by data availability. Ideally the measure should reflect what actually goes into the production process – it should be based on actual hours worked and quality adjusted (for skills, education, experience levels etc.). Readily available estimates are often not produced to this ideal. The labour productivity data used herein are not quality adjusted and use a mix of hours and more simple measures of per worker or per filled job. In reality, using hours or workers as the productivity denominator often makes little difference to the growth in productivity observed or the relative productivity picture across the UK.

### Measuring regional and subregional output

Measures of regional output, which form regional productivity estimates, include an element of modelling (to apportion firm-wide output to local plants and proxy missing data) and this can underestimate the true output generated in regions outside of London whilst overestimating the value of output in the Capital.

The ONS measures of regional productivity are also nominal measures and so fail to account for different levels of inflation across the country. In regions where prices are rising faster (i.e. inflation is higher) this will give a false impression of productivity growth that is higher than actual.

More broadly, and an issue that applies to all output estimates (including at national level), there is a question as to how well national accounts incorporate intangible capital (data, branding and so on)<sup>1</sup>. This can lead to underestimates of the true value of output and is likely to be more important for certain sectors (as they are often knowledge based assets they are likely to be more important in knowledge based sectors).

For these reasons the analysis that follows should be interpreted with a degree of caution.

<sup>&</sup>lt;sup>1</sup> See for example <u>Getting in touch with intangible assets, 2018, Rachel O'Brien</u> and <u>Intangible capital and economic growth,</u> 2006, NBER.





### Geography

This report has relied on readily available data which limits the choice of geography. The main geography of interest is the West Midlands Combined Authority and we have tried to stay as close to that geography as the data allows.

### Why do we care about productivity?

Growth in productivity means an economy can produce more without needing to use more inputs. As such, it is one of the most fundamental drivers of improvements in living standards, allowing people to enjoy more, or better quality, goods and services.

Historically, productivity has grown steadily over time, allowing real (i.e. adjusted for inflation) wages and living standards to follow suit. Since the 2008 financial crises, however, productivity growth has diverged from its long run trend, and stagnated – the reason for this change in trend is what is known as the 'productivity puzzle'.

#### Productivity and well-being:

Whilst productivity growth drives growth in incomes it does not necessarily drive wellbeing. London, for example, has the highest productivity in the UK but scores lowest on life satisfaction and worthwhileness measures<sup>1</sup>. This is important to bear in mind – improving productivity may mean households are financially better off but it doesn't automatically follow that their wellbeing is higher.

<sup>1</sup>Annual personal well-being estimates, ONS.

The ONS <u>estimates</u> the average market sector wage in the UK would be just over £5,000 higher in 2018 for the average worker if productivity growth had continued.

The absence of steady productivity growth over the last decade or so is not unique to the UK alone but it does raise important questions as to how productivity growth, and consequently living standards, can be reinvigorated.

At the national level, capital shallowing (workers having less capital per hour worked) and slower growth in multi factor productivity has been a drag on labour productivity growth (output per hour worked) since the 2008 economic downturn<sup>2</sup>. The former, accounting for around a third of the productivity gap, is likely the result of business uncertainty driving a reluctance to invest in capital, which is often the less flexible input to production (compared to labour). In contrast, labour composition (or the quality of labour) has maintained its pre-downturn trend and helped to mitigate the extent of the productivity gap with the pre-downturn trend.

<sup>&</sup>lt;sup>2</sup> <u>Multi-factor productivity estimates, UK</u>: July to September 2019, ONS





#### Figure 1: Growth in output per hour from 1994 and contributions to the productivity gap from 2008, UK.



Source: Multi-factor productivity estimates, UK, ONS

Output per hour trend

# There are large variations in productivity across the UK and within regions...

Given the importance of productivity growth in driving living standards it is central to 'levelling up' economic and social outcomes across the UK.

Whilst variations in labour productivity within-countries is common, the spread within the UK is comparatively large<sup>3</sup>, with the West Midlands sitting towards the middle/bottom of that distribution; in 2019 the West Midlands GOR produced output worth £31.30 per hour of labour, 11% lower than the UK (£35.20 per hour) and 33% lower than the most productive region (London, £46.40 per hour).

Within-region productivity is also common. This is perhaps unsurprising given how economic activity tends to be spread; more urban, business-dense, areas benefiting from agglomeration economies typically have higher productivity than more rural areas whose economic activities are concentrated in servicing the local economy.

London has the greatest gap between productivity in its most and least productive subregions (£25.30 per hour) and the lowest gap is in the East Midlands (with a £7.20 per hour gap). For the West Midlands government region, the gap is high - it is the 4<sup>th</sup> highest region in absolute difference and 2<sup>nd</sup> in percentage difference— its most productive subregion (Solihull) produces £21.50 (47%) per hour more output than the least productive subregion (County of Herefordshire).

<sup>&</sup>lt;sup>3</sup> See for example, Regional and subregional productivity comparisons, UK and selected EU countries: 2014, ONS.







### Figure 2: Nominal smoothed output per hour for all ITL3 subregions in Great Britain grouped by ITL1 region, 2019, UK = 100

Source: ONS Subregional Productivity, 2021

At ITL3 level, only 3 subregions in the wider West Midlands had labour productivity levels above the UK average in 2019 (even when London is excluded from the average); Solihill was the highest (£45.20 per hour), followed by Warwickshire (£37.40 per hour) and Coventry (£36.20 per hour).







### Figure 3: Labour productivity in the West Midlands subregions, 2019

Note: UK excluding London has been calculated by reverse engineering using hours data provided within the publication datasheet.

Source: ONS Subregional Productivity, 2021 (Nominal, smoothed GVA (B) per hour worked at ITL2 and ITL3)

## ... and productivity growth has been unevenly distributed across the West Midlands.

In the West Midlands GOR labour productivity grew by £8.85 (39%) between 2004 and 2019. However, this growth was lower than the UK-average (£9.75) meaning its relative position to the UK worsened slightly. Within the West Midlands, at ITL2, Herefordshire, Worcestershire and Warwickshire had growth in labour productivity that was similar to the UK between 2004 and 2019 (£9.80 compared to £9.75 in the UK). In West Midlands ITL2 the growth was slightly lower (£9.40) and lower still in Shropshire and Staffordshire (£6.95).

At the lower geographical level (ITLS3) the highest growth within West Midlands was in Solihull (£15.40), which was the eighth largest increase across the UK. This was followed by Warwickshire (£11.35) and Coventry (£11.05).

Whilst Solihull and Warwickshire had above UK-average labour productivity in 2004 (and maintained that relative position in 2019), Coventry went from having lower labour productivity than the UK-average in 2004 to above UK-average in 2019. Coventry was the only subregion in the West Midlands to experience a change in its labour productivity relative to the UK-average.

All other areas had lower than UK-average productivity growth, with the lowest in Wolverhampton (£3.80), Herefordshire (£4.60) and Shropshire (£5.00). Wolverhampton's low growth placed it as the second lowest subregion in the UK for productivity growth in the decade and a half to 2019.







#### Figure 4: Labour productivity growth in the West Midlands subregions (2004, 2019)

Source: ONS Subregional Productivity, 2021 (Nominal, smoothed GVA (B) per hour worked at ITL2 and ITL3)

The ONS have also produced estimates of labour productivity for towns and cities. These estimates are per filled job so are not comparable to the hourly estimates above. It is worth noting as well that although the data is smoothed it can still have volatility, which is not unusual for small area data based on surveys.

Looking at towns and cities across the West Midland LEP areas (GBSLEP, CWLEP and BCLEP), only two had levels of productivity above the UK average in 2019: Solihull (£91.620) and Warwick (£89,870). However, a few areas had productivity levels similar to the UK average (£56,670 per filled job), including Coventry (£56,540 per filled job), Rugby (£55,560 per filled job) and Burton upon Trent (£55,150 per filled job).

Whilst Solihull and Warwick have high levels of productivity, they have also seen some of the greatest growth (both within the LEP and nationally). Between 2009 and 2019 productivity grew by +£35,700 (66%) in Warwick (the 9<sup>th</sup> highest growth amongst all towns/cities in the UK) and by +£30,700 (50%) Solihull (the 10<sup>th</sup> highest growth amongst all towns/cities in the UK). The third largest growth in the LEP was Smethwick (+£15,900).

Kingswinford was the only town/city in WMLEP to see a decline in productivity (-£12,500), and had the 8th worst performance of all towns/cities in the UK.







### Figure 5: Labour productivity in towns and cities in GBSLEP (blue), CWLEP (red) and BCLEP (green), 2009 and 2019.

Note: ONS towns and cities data are based on the built-up area subdivision boundaries (BUASD), or built-up area boundaries (BUA) where no subdivisions exist. They are based on the location of residents and not business. Only towns with a population of over 25,000 are included in this dataset.

Source: ONS UK GVA and productivity estimates for other geographies, 2021 (smoothed GVA per filled job)

# But what accounts for West Midlands' productivity gap?

Some industries are more productive than others. A natural assumption is that part of the differences in productivity across the country may be because of the concentration of more productive industries in some areas than others.

## The West Midlands productivity gap is due to lower productivity *within* industries...

The ONS have produced analysis looking at how much of the regional gaps in labour productivity can be explained by these differences in the industrial structures across regions and how much is due to differences at the firm-level. Unfortunately, the analysis is based on 2015 data but many of its conclusions are likely to remain relevant today.





#### About the ONS regional firm-level analysis:

The output data used in the ONS regional firm-level productivity analysis is derived from the Annual Business Survey (ABS). This includes all local units (for example each office, factory, warehouse etc) of a firm registered on the Inter-Departmental Business Register (IDBR). Local units of a firm/enterprise may be engaged in different parts of the business such as production, accounting or head office. Therefore, each local unit is assigned its own Standard Industrial Classification 2007 (SIC 2007) code, which corresponds to the local unit's principal activity. However, the allocation of business activities in firms with multiple local units is likely to underestimate the value that is attributable to some areas and the data is not adjusted for price variations across regions.

The ABS excludes the agricultural and financial sectors as well as some small firms, the self-employed and the public sector. As such, the analysis covers approximately two-thirds of the UK economy in terms of gross value added.

In the West Midlands, in 2015, labour productivity was 9-percentage points below the Great Britain (GB) average (aggregate average labour productivity index). ONS analysis suggests the industry structure of the West Midlands plays a positive role in its labour productivity, but not enough to offset the low average plant productivity; if West Midlands had the same industrial structure as Great Britain (but retained its average productivity for each industry) it would have an 11-percentage point gap in productivity with the GB average (firm productivity index). In contrast, if it retained its industrial structure but each industry had the same productivity as GB the productivity gap would only be 1-percentage points (industry composition index).

#### What the ONS Productivity Gap Analysis Measures:

Firm (plant) Productivity Index shows what productivity would be if the region had the same industrial composition as GB as a whole. This shows how much remains unexplained by sectoral composition alone i.e. the effect of firm (local plant)-level productivities on the region's aggregate productivity.

Industry Composition Index shows what productivity would be if each industry had the same productivity as the corresponding industry's GB productivity. It demonstrates the effect of the industrial composition on aggregate productivity.

Residual covariance provides a link between industry shares and industry productivity in an area. If an area has a high share of industry employment relative to Great Britain in the industries to which it has productivity advantages, then it would have a large positive residual covariance.





### Table 1: Sources of aggregate average labour productivity (per worker) across Great Britain regions (Great Britain = 100)

	Aggregate Av. Labour Productivity Index	Firm Productivity Index	Industry Composition Index	Aggregate Av. Labour Productivity, GB	Residual Covariance
North East	85	85	99	100	1
North West	91	91	99	100	1
Yorkshire & Humber	84	85	97	100	1
East Midlands	78	80	100	100	-1
West Midlands	91	89	99	100	3
E. England	91	91	100	100	0
London	143	136	102	100	5
South East	107	105	101	100	1
South West	82	83	98	100	1
Wales	74	75	98	100	2
Scotland	99	93	103	100	3

Source: Regional firm-level productivity analysis for the non-financial business economy: April 2018, ONS (Based on 2015 data for NUTS 1 areas).

### ... but there are variations across its subregions.

But this aggregate, regional picture, hides differences across the West Midlands. Hertfordshire, Worcestershire & Warwickshire is one of a handful of places where the industry structure has a more significant effect on aggregate productivity than firm-level productivities. And both the industry structure and plant productivity have a positive effect on relative productivity.

In Shropshire & Staffordshire both the firm productivity effect (-13-percentage points difference to GB aggregate productivity) and industry mix effect (-1-percentage points) are a drag on aggregate productivity. The impact of plant productivity is, however, much greater.

In West Midlands (ITL2) the industry mix effect is positive (+3-percentage points) but not large enough to offset the firm productivity effect (-11-percentage points).



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#### Figure 6: Sources of aggregate average labour productivity (per worker) for selected subregions (Great Britain = 100)



Source: Regional firm-level productivity analysis for the non-financial business economy: April 2018, ONS. Based on 2015 data for selected NUTS 2 areas

### So where are the firm-level differences greatest?

The analysis above highlights the importance of productivity differences within industries in explaining West Midlands' aggregate productivity gap. What follows is a closer look at the productivity distributions within industries to better understand where West Midlands may have the greatest opportunities to plug its productivity gap.





#### Firm-level analysis and sector groupings:

The ONS firm-level analysis that follows uses high-level sector groupings based on either technological or knowledge intensity.

Manufacturing sectors are grouped by technological intensity (R&D expenditure and value added) based on the Statistical classification of economic activities in the European Community (NACE) at twodigit level. The level of R&D intensity serves as a criterion of classification of economic sectors into Medium-High Tech Manufacturing (MHTM) (comprised of high-tech and medium/high) and Low-Medium Tech Manufacturing (LMTM) (comprised of low-tech and medium/low tech).

Services are grouped into Knowledge-Intensive Services (KIS) and Less Knowledge-Intensive Services (LKIS) based on the share of tertiary educated persons at NACE two-digit level. The sectoral approach is used for all indicators except data on high-tech trade and patents. Knowledge-intensive services include high-tech knowledge-intensive sectors such as telecommunication or information service activities; market services such as architectural and engineering activities, technical testing and analysis; or legal and accounting activities and other services such as veterinary activities. Less knowledge-intensive services sectors include accommodation and food service activities or wholesale and retail trade sectors.

Other sector includes Construction, Real estate and Non-manufacturing production.

### In the West Midlands the spread of plants' productivity is widest in the less knowledge intensive services...

Plants in manufacturing sectors and knowledge-intensive services sectors generally have higher productivity levels than firms in less-knowledge intensive services sectors throughout the Great Britain regions.

In West Midlands, median productivity is highest in Medium/High Tech manufacturing (£57,190 per worker), followed by Knowledge Intensive Services (£55,430). Both sectors have productivity twice as large as the median productivity in Less Knowledge Intensive Services (£25,110), and larger than the median in Low-Medium Tech Manufacturing (£46,150).

Local plant productivity in the West Midlands' Less Knowledge Intensive Services is the most widely spread; those in the top 75% are 3.2 times more productive than those in the bottom 25%. Meanwhile, the spread of plant productivity in Knowledge Intensive and Manufacturing sectors is very low





### Figure 7: Distribution of local plant productivity by industry group (GVA per worker £000s), West Midlands, 2015



Source: Regional firm-level productivity analysis for the non-financial business economy: April 2018, ONS.

West Midlands has the third highest median productivity in LKIS, after London and the South East. However, London particularly, has a right skew in distribution, meaning that its average productivity is much higher.

In the KIS, West Midlands has the fourth highest median productivity, after London, South East and South West. However, it has a left skew distribution, meaning that there is a wide spread for the bottom half performing local units but a minimal spread amongst the top half. Its mean average is therefore likely to rank much lower.





### Figure 8: Distribution of local plant productivity across Great Britain in KIS and LKIS industries (GVA per worker £000s), 2015



## ... but there is a relatively low spread of plants' productivity in manufacturing sectors.

West Midlands has the joint (with London) fourth highest median productivity in MHTM, after the East, Yorkshire & Humber and South East. However, half of local plants in MHTM in WM are within around 20% of the median productivity.

Meanwhile, it has the third highest median productivity in LMTM, after Scotland and South East. Again, there is relatively small spread in local plants' productivity; half of local plants in LMTM in the West Midlands are within around 10% of the median productivity.





### Figure 9: Distribution of local plant productivity across Great Britain in MHTM and LMTM industries (GVA per worker £000s), 2015



Medium-High Tech Manufacturing

Source: Regional firm-level productivity analysis for the non-financial business economy: April 2018, ONS.

This narrow spread of plant productivity within both the medium-high and low-medium manufacturing sectors in the West Midlands may reflect a narrow range of activity within these broad sector classifications.

# Given the size of the low knowledge intensive services it is important in explaining the aggregate productivity gap.

In the West Midlands, similarly to the rest of GB, nearly 60% of employment in 2015 was in LKIS, accounting for just over 40% of GVA. KIS was the second largest in both employment and GVA contributions.







#### Figure 10: Share of employment and output (GVA) by industry groups, 2015

Source: Regional firm-level productivity analysis for the non-financial business economy: April 2018, ONS.

The LKIS sector also dominates the composition of local plant - just over half (54%) of local plants in the West Midlands are in the LKIS – this is the 6th highest of all regions with London at the lowest (45%) and Wales the highest (58%).

In contrast, plants in the LKIS make up 93% of plants in the bottom 20% of the productivity distribution – this is the 6th highest of all regions with East England at the lowest (87%) and Scotland the highest (95%). This demonstrates the weight that plants in this sector have on the overall productivity distribution in the West Midlands.

However, the West Midlands also has a high share of plants in the LKIS within the top 20% of the productivity distribution. With nearly one in every 2 plants in the top 20% (48%) the share is over 4 times larger than in London (11%) and 9 percentage points above the second highest region (North East).

Plants in the 'other' sector (composed of primary and utilities, real estate and construction) play a significant role in the upper quintile of the productivity distribution (40%), despite only one in six (16%) of all plants in the region belonging to the 'other' sector. Only the East of England (44%) had a higher share of plants in 'other' in the top 20%.





Figure 11: Industry group of local plants in the population and in the top 20% and bottom 20% of the productivity (GVA per worker, £000s) distribution across Great Britain, 2015



Source: Regional firm-level productivity analysis for the non-financial business economy: April 2018, ONS.

### Micro firms are more concentrated in KIS and 'other' sectors and have the highest *medium* productivity...

Plant productivity may also be linked to the size and age of the firm it belongs to. For example, a small store of a large supermarket chain may benefit from more efficient administrative systems or large supply chains (hence a cost advantage) compared with a standalone similar store. Equally older firms may have greater experience and networks that allow them to operate more effectively than younger, newer firms still learning the market. However, the impact of age and size may simply be attributable to their dominance in certain industries - plants of larger and older firms may be more prevalent in naturally more productive sectors.





#### Size and age productivity analysis:

To analyse how firm size and age is related to plant productivity, the ONS has linked the ABS to the Inter-Departmental Business Register (IDBR). Age and size relate to the enterprise as a whole, but the productivity analysis continues to be carried out at the local plant level.

In most cases, local plants, reporting units and enterprises are one and the same. On average, around one-quarter of the local plants across regions belonged to a multi-plant enterprise in 2015, with the North East having the highest (31%) and London having the lowest (21%) proportions. The larger the enterprise, the more likely they are to have more than one plant. In the dataset, over 95% of the enterprises with 250 or more employment were multi-plant enterprises and over 90% of the micro-plants were single establishments across the regions and countries in Great Britain.

Median productivity of plants belonging to micro firms (1-9 employment) (Figure 12) appears to generally be higher than in local plants belonging to larger firms. However, large firms tend to have a longer top tail and higher average productivity suggesting productivity advantages of large firms. This wider spread of productivity among plants of larger firms may be partly due to large firms having local plants specialising in different activities (ranging from low to high productivity) as well as their local plants ranging in size (some will have many small plants whilst others will have a few large plants). Firms with inward and/or outward foreign-direct investment (FDI) also tend to be larger and may help explain the higher mean productivity.





Source: Regional firm-level productivity analysis for the non-financial business economy: April 2018, ONS. Based on 2015 data for selected NUTS 1 areas. GVA per worker £000s

Key: Arrow = Median; Crosses = Mean; Bars = Interquartile range; Lines - 10th & 90th deciles

The high median productivity of micro firms can be partly explained by their higher share in the more productive KIS industries. In the West Midlands, whilst 76% of all local plants were micro firms this proportion rises to 89% and 87% within KIS and 'Other' sectors respectively.

On the other hand, there is a -7.2 percentage-point difference in the share of micro firms in manufacturing compared to the share across all industries (the second largest differential of all regions).





#### Figure 13: Distribution of local plants in industry groups by firm size, West Midlands, 2015



Note: Other include Construction, Real estate and Non-manufacturing production. Source: Regional firm-level productivity analysis for the non-financial business economy: April 2018, ONS. Based on 2015 data for NUTS 1 areas.

Within manufacturing, the West Midlands had the highest proportion of small business (10-49 employment) at 20%, which is twice the proportion small business represent across all industries.







#### Figure 14: Distribution of local plants in industry groups by firm size across Great Britain, 2015

Note: Other include Construction, Real estate and Non-manufacturing production. Source: Regional firm-level productivity analysis for the non-financial business economy: April 2018, ONS. Based on 2015 data for NUTS 1 areas.

Micro firms are also more likely to be in the top 20% of the productivity distribution across the country. In the West Midlands, micro firms make up 82% of the plants in the upper quintile of the productivity distribution, compared to their 76% across the whole distribution. This -6 percentage-points difference is the 3rd highest across regions.

On the other hand, there are proportionately more large firms (250+) in the bottom 20% of the productivity distribution relative to the whole distribution – ranging from +3 percentage points in the North East to +15 percentage points in East Midlands. In the West Midlands the difference in shares is +11 percentage points. Plants belonging to small firms are also disproportionately represented in the bottom 20% of the productivity distribution, but this is smallest in West Midlands.





Figure 15: Distribution of local plants, by firm size in the population and in the top 20% and bottom 20% of the productivity distribution across Great Britain, 2015



■1 to 9 ■10 to 49 ■50 to 99 ■100 to 249 ■250 and over

Source: Regional firm-level productivity analysis for the non-financial business economy: April 2018, ONS. Based on 2015 data for NUTS 1 areas.

### Younger firms are also more concentrated in the knowledge intensive services, but older firms have the highest average productivity.

Firm productivity may also be related to the age of the enterprise it belongs to. For plants belonging to enterprises up to 20 years old (Figure 16) there is not much variation in the median productivity (between £40,300 and £43,400 in the West Midlands). However, similarly to other regions, the long top tail of the distribution of firms aged 20+ means that the mean/average productivity of this group is the highest (£51,500).

Within the productivity distribution of firms aged 11-15 years across regions, West Midlands has the 5th highest median value (£42,400) but its mean average brings its rank down to 9th (£39,400) i.e. the distribution is more left-skewed with a relatively larger bottom tail. The same is true for the 16-20 age distribution – West Midlands ranks 4th on its median value (£40,300) but 8th on its mean value (£39,200).







### Figure 16: Productivity (GVA per worker, £000s) distribution of local plants by firm age across selected areas, 2015

Source: Regional firm-level productivity analysis for the non-financial business economy: April 2018, ONS. Based on 2015 data for selected NUTS 1 areas. GVA per worker £000s

Key: Arrow = Median; Crosses = Mean; Bars = Interquartile range; Lines - 10th & 90th deciles

Nearly two in five (39%) of all plants in West Midlands were young (under 6 years) - in the middle rank across regions, with the highest proportion in London (52%). And young firms were disproportionately present in the KIS sectors (52%).

Meanwhile, 28% of all plants in West Midlands belonged to older firms (aged 20+) – again, this is in the middle of the ranking across regions, with the highest proportion in Wales (33%) and lowest in London (19%). Older firms have a higher representation in the manufacturing and LKIS sectors across all regions, although West Midlands has the highest proportion (40%). Given the magnitude of employment in LKIS this may help explain the right skew (long tail) of older firms in West Midlands.

#### Figure 17: Distribution of local plants in industry groups by firm age, West Midlands, 2015



Note: Other includes Construction, Real estate and Non-manufacturing production. Source: Regional firm-level productivity analysis for the non-financial business economy: April 2018, ONS. Based on 2015 data for NUTS 1 areas.







#### Figure 18: Distribution of local plants in industry groups by firm age across Great Britain, 2015

■ 20 and over ■ 16 to 20 ■ 11 to 15 ■ 6 to 10 ■ 1 to 5 ■ Under 1

Note: Other include Construction, Real estate and Non-manufacturing production. Source: Regional firm-level productivity analysis for the non-financial business economy: April 2018, ONS. Based on 2015 data for NUTS 1 areas.

Older firms also have a higher representation of plants in the bottom 20% of the productivity distribution, meaning some of the least productive plants tended to be part of older firms. On the other hand, there is a higher representation of young firms (<6 years) in the top 20% of the productivity distribution.

In general, whilst there are some variations in productivity by enterprise age and size across regions these are small. As such, differences in age and firm size explains, at best, only a small part of West Midlands' productivity gap.





### So why are some plants and firms more productive?

In the non-financial business economy, differences *within* industries explains more of the UK regional productivity gaps.

Some of this may be due to regional price differentials that are not picked up in the data, particularly in the non-tradeable good/services. Some may also be the result of the data not being quality adjusted (so not accounting for occupational/skill composition<sup>4</sup>) within the same industry across regions or due to other differences hidden in the sector classifications. For example, a multinational law firm in London may have a different specialisation (hence different labour productivity levels) to a small local law firm elsewhere, but both will have the same two-digit industry grouping.

Firm productivity differences can also be driven by a myriad of both internal (age, size, management<sup>5</sup>, foreign investment<sup>6</sup>) and external (infrastructure<sup>7</sup>, agglomeration, market size<sup>8</sup> etc) factors<sup>9</sup>. Further research may be needed to hone in on how these affect the firm-productivity within the West Midlands specifically.

<sup>&</sup>lt;sup>9</sup> See for example, <u>UK Regional Productivity Differences: An Evidence Review, Industrial Strategy Council, R.Zymek and</u> <u>B.Jones, 2020.</u>



<sup>&</sup>lt;sup>4</sup> See for example, <u>Local Productivity: The real differences across UK cities and regions</u>, <u>Sheffield Hallam University</u>, <u>C.Beatty</u> and <u>S.Fothergill</u>, 2019.

<sup>&</sup>lt;sup>5</sup> See, for example, <u>Management practices and productivity in British production and services industries - initial results from the</u> <u>Management and Expectations Survey: 2016, ONS</u>.

<sup>&</sup>lt;sup>6</sup> See, for example, Foreign direct investment and labour productivity, a micro-data perspective, 2012-2015, ONS.

<sup>&</sup>lt;sup>7</sup> See, for example, <u>Infrastructure and Productivity: A Review Produced for West Midland Combined Authority, Productivity and</u> <u>Skills Commission, J. Du and M. Douch, March 2018.</u>

<sup>&</sup>lt;sup>8</sup> See, for example, <u>Exploring labour productivity in rural and urban areas in Great Britain: 2014, ONS</u>.

# Annex A: Firm-level productivity distribution at city region and broad industry level.

The ONS have also produced regional firm-level productivity analysis at city region and broad industry level. The analysis also uses the ABS (albeit 2014 data) and the IDBR.

Median productivity (GVA per worker) in the West Midlands City Region varied across sectors, from £12,000 in Accommodation & Food to £65,000 in Construction.

Compared to Great Britain, median productivity was higher in West Midlands for some sectors, such as Construction where the median productivity was £15,000 above the GB. But there are quite a few sectors where the median productivity is lower in the WM.

### Figure A1: Productivity difference between West Midlands City Region and Great Britain, 2014, £ per worker



Source: Regional firm-level productivity analysis for the non-financial business economy: Jan 2017, ONS. Based on ABS 2014.





Figure A2: Productivity distribution across industry groups in West Midlands City Region and Great Britain, 2014, £000 per worker



Key: Arrow = Median; Bars = Interquartile range; Lines – 10<sup>th</sup> & 90<sup>th</sup> deciles

Source: Regional firm-level productivity analysis for the non-financial business economy: Jan 2017, ONS. Based on ABS 2014. WM is the West Midlands City Region, GB is Great Britain.

The following charts show the productivity distribution of firms across city regions for each broad industry group to demonstrate West Midland City Region's relative position.





### Figure A3: Productivity distribution across industry groups in City Regions and Great Britain, 2014, £000 per worker







#### Construction





#### Mining and Utilities





#### Transportation and storage







#### Accommodation and food service activities

Real Estate Activities







#### The West Midlands Regional Economic Development Institute and the City-Region Economic Development Institute Funded by UKRI



