

# The Productivity Puzzle

## Introduction

The economic prosperity of a country is often judged by its growth in output. Output, also known as Gross Domestic Product (GDP), is the value of all goods and services produced in an economy within a given time frame. Productivity is defined as the amount of goods and services that a worker produces in that same period of time. A more productive workforce implies each worker is producing more units of goods and services, i.e. more cars per hour or more phone calls per minute. Labour productivity is an important factor in determining the productive potential of the economy. Countries with strong labour productivity growth tend to benefit from high rates of growth and low inflation.

Labour productivity can be calculated as output per worker, output per job or output per hour; with the latter being the more conventional approach. Productivity can grow as a result of technological advances or a better educated or more specialised workforce. From a policy perspective, if labour productivity is falling, it could be an indicator that more should be done to improve the delivery of education or job specialisation. Indeed, on a national scale, labour productivity changes are a main driver of economic policy.

The UK is currently experiencing what has become termed as a “productivity puzzle”, this refers to the fact that our productivity has stagnated since 2010. It's not just the UK that has suffered from weak productivity growth, it's across all advanced countries, but in the UK, the weakness is worse, meaning UK workers across every sector, urban and rural are producing less output per hour worked than our competitors in France, Germany and the US.

## How has the UK's productivity changed over time?

Figure 1, shows how the UK's productivity has changed over time since 1994. Following years of steady growth, output peaked prior to and fell during the economic downturn. However, due to a strong labour market performance accompanying a relatively weak recovery in output growth, productivity has not returned to its pre-downturn trend. Productivity in Quarter 4 2017, as measured by output per hour, was 16.4% below its pre-downturn trend – or, equivalently, productivity would have been 19.6% higher had it followed this pre-downturn trend.

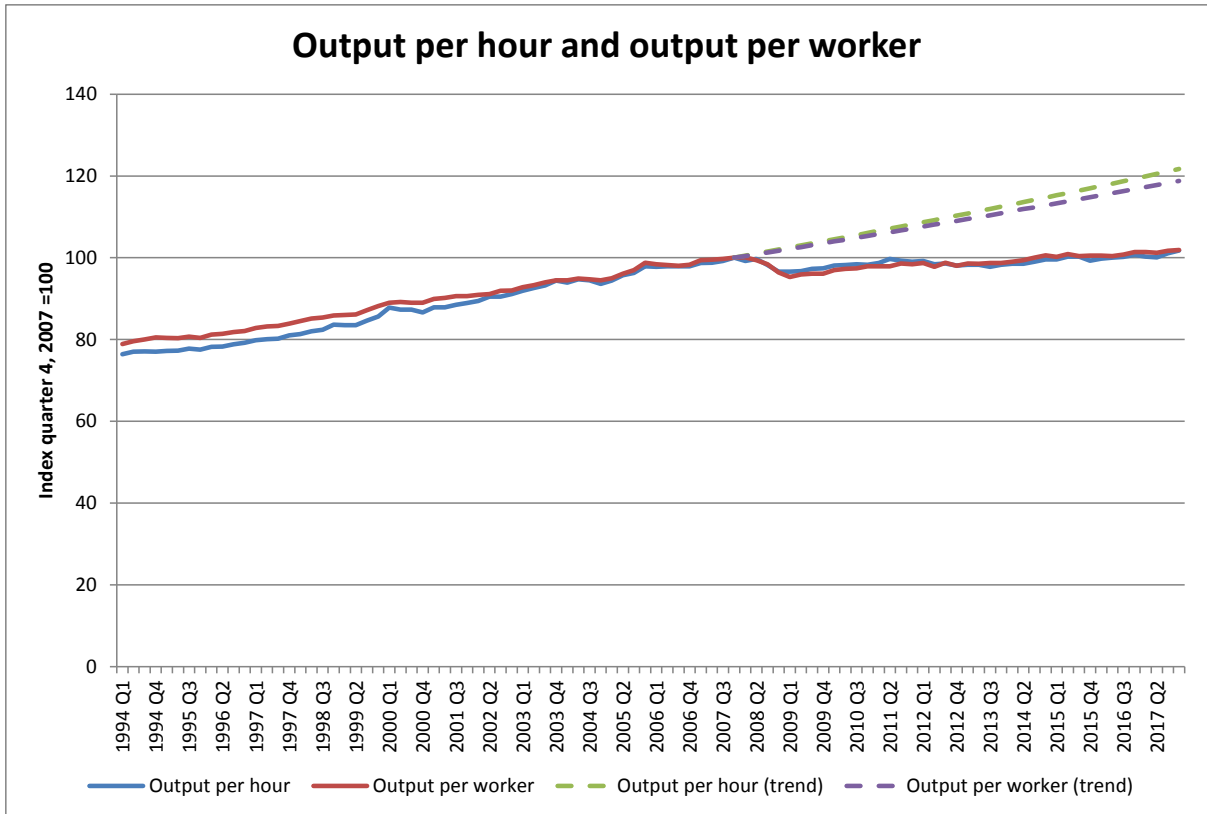


Figure 1: UK Output per hour and output per worker<sup>1</sup>

### How does the UK compare to other G7 countries?

The ONS has compared annual estimates of labour productivity for the G7 developed countries (Canada, France, Germany, Italy, Japan, UK and US) up to 2016. Comparability across countries is achieved by using estimates of GDP and labour inputs from a common source (the Statistics Directorate of the Organisation for Economic Co-operation and Development (OECD)), this provides the best data available for international comparisons.

The results showed that when compared with the rest of the G7, the UK had a lower output per worker and output per hour worked in 2016. In terms of GDP per worker the greatest difference was with the US, with a difference of 27.3%, while in terms of GDP per worker the greatest difference was with Germany, with a difference of 26.2%. Japan was the only G7 country that had a lower level of productivity than the UK across both measures.

<sup>1</sup> Labour productivity, UK: October to December 2017

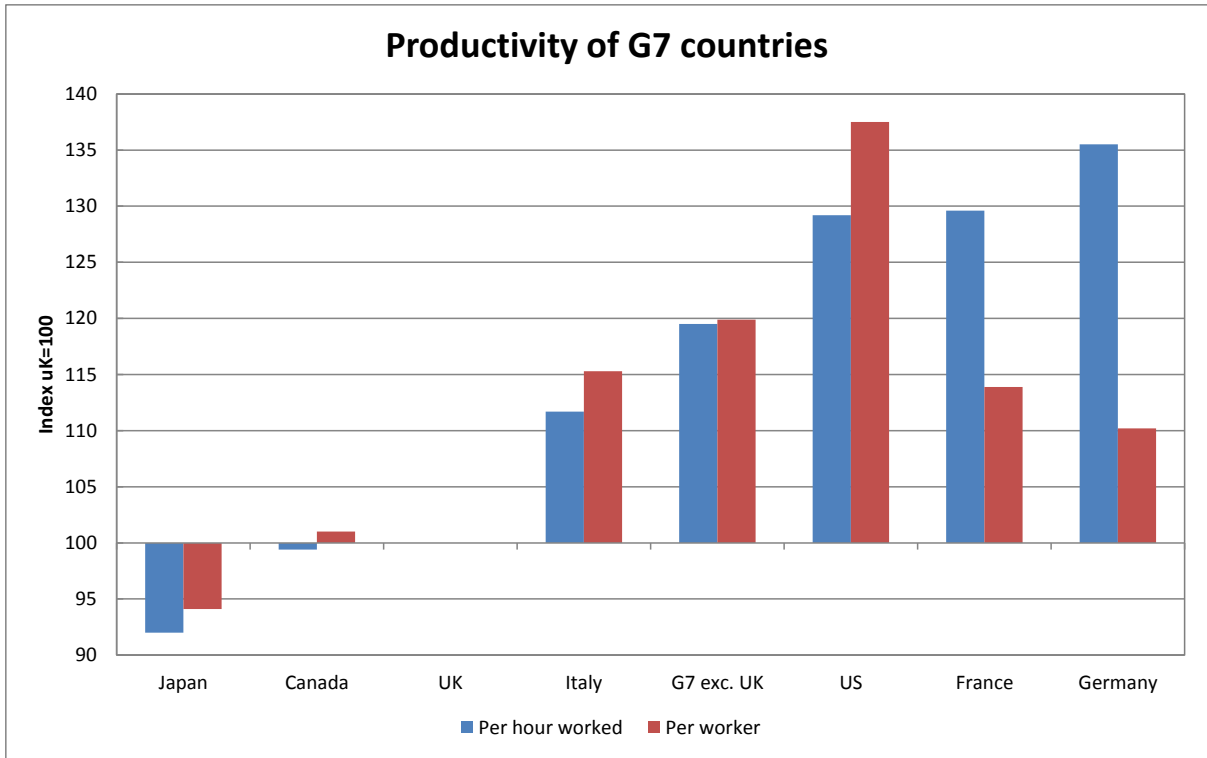


Figure 2: Productivity of G7 countries, 2016<sup>2</sup>

Figure 3 expands the analysis to capture all of the available European economies. The UK's productivity lies within the middle of the European economies with a position of 12<sup>th</sup> out of the 26 nations included in terms of GDP per hour worked and 13th in terms of GDP per persons employed.

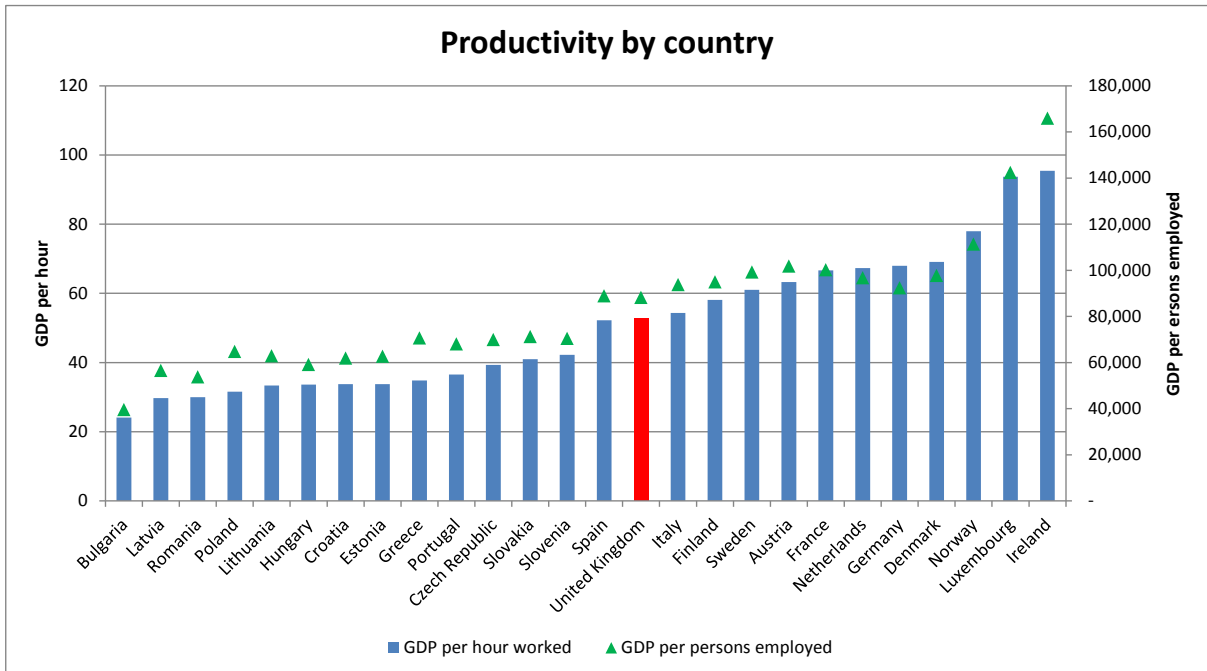


Figure 3: Productivity by country, 2016<sup>3</sup>

<sup>2</sup> International comparisons of UK productivity (ICP), final estimates: 2016

<sup>3</sup> OECD, [http://stats.oecd.org/Index.aspx?DataSetCode=PDB\\_LV#](http://stats.oecd.org/Index.aspx?DataSetCode=PDB_LV#)

The nature of this productivity gap has generated significant policy interest, but analysis to explain it has been limited due to the availability of comparable data across countries and appropriate exchange rates. Experimental work has recently been carried out that enables us to look at labour productivity for 29 European countries on a nine-industry breakdown. These estimates are principally for 2014. The results of this research indicate that the UK's productivity gap to other leading European G7 economies is replicated at industry level – although the size of that gap varies. Across nine industries the UK has the lowest labour productivity of this group of countries in five industries; and is third in the remaining four categories. Even among the UK's most productive industries measured on this basis – including Production and Financial and Insurance Activities the UK ranks relatively poorly, and there is a substantial gap between the UK and the most productive economy in this group.

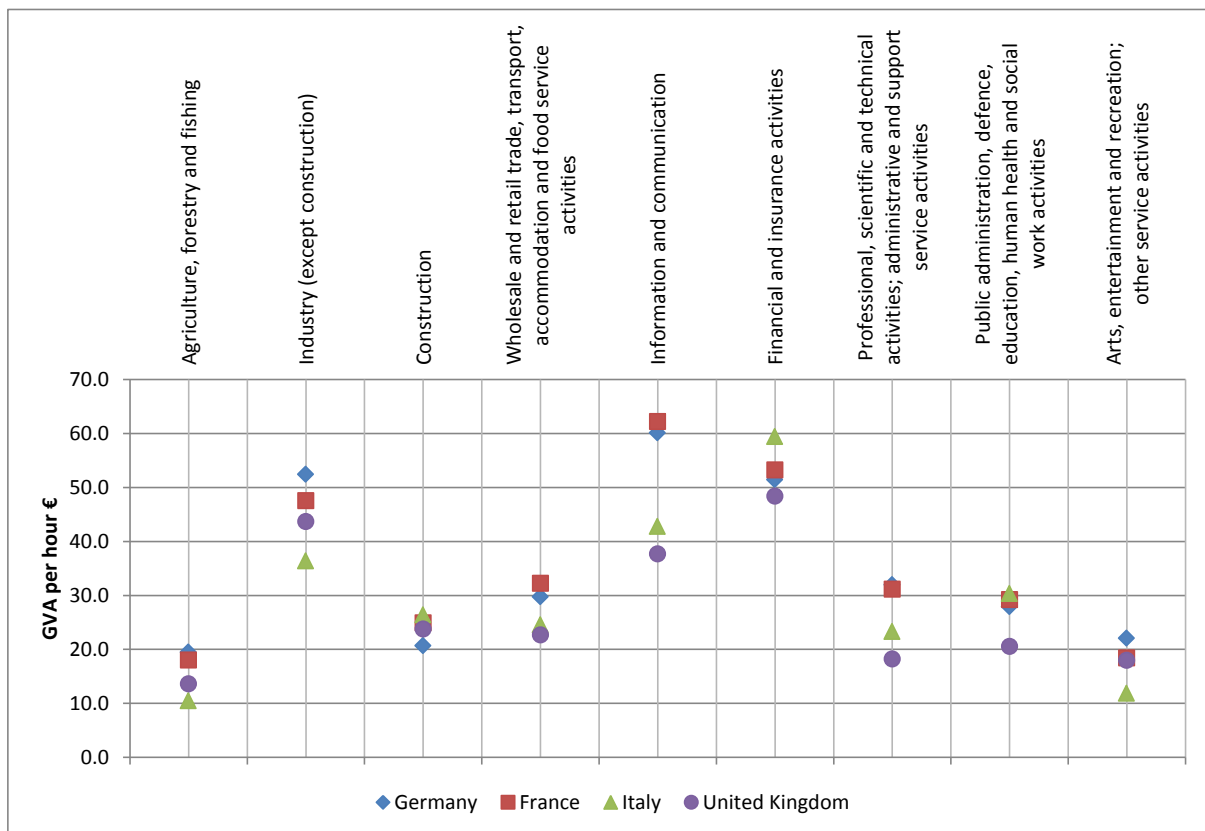


Figure 4: Output per hour by sector and European G7 countries, 2014<sup>4</sup>

Figure 5 expanded the analysis to encompass all of the available European economies and shows the UK's productivity lies within the middle of the European economies with an average position of 18th of the 29 nations included. Notable exceptions include relative weakness in the information and communication industry and financial and insurance activities, as well as relative strength in the production industries.

<sup>4</sup> International Comparisons of UK Labour Productivity by Industry

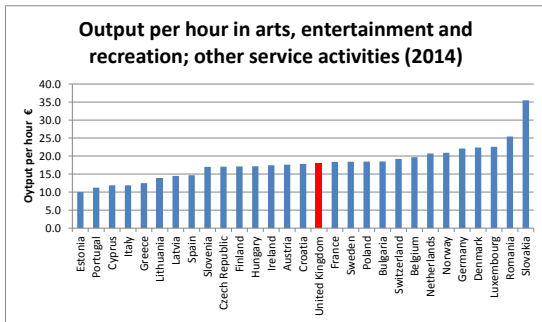
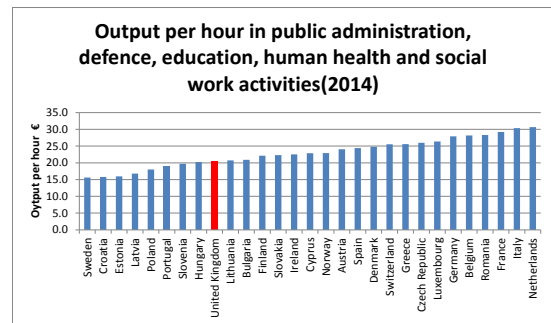
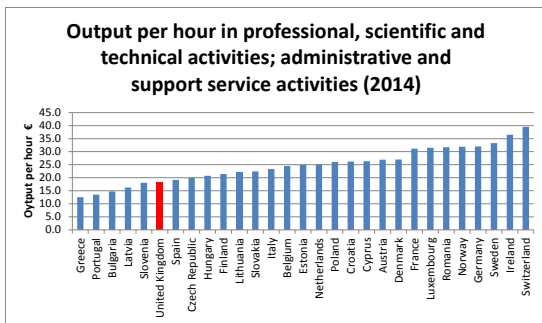
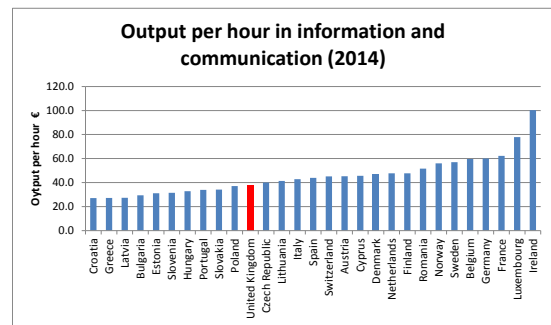
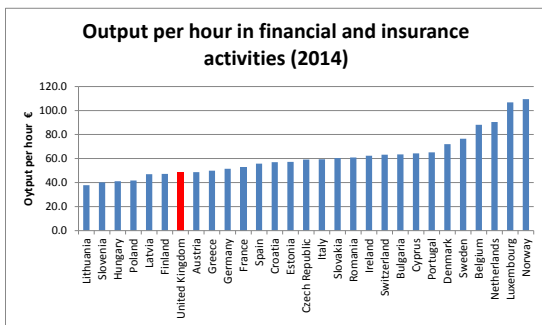
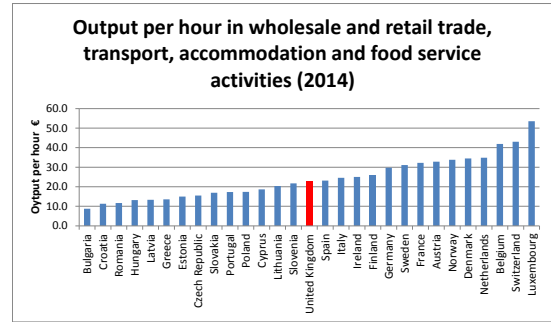
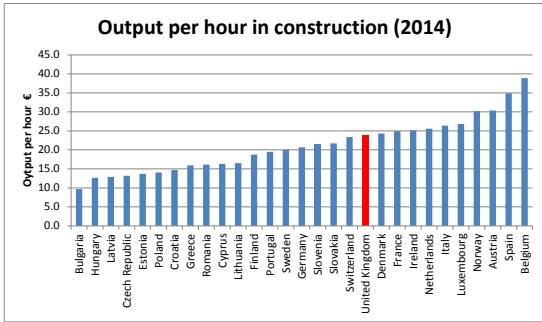
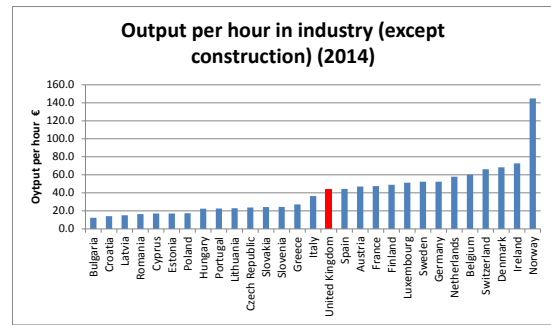
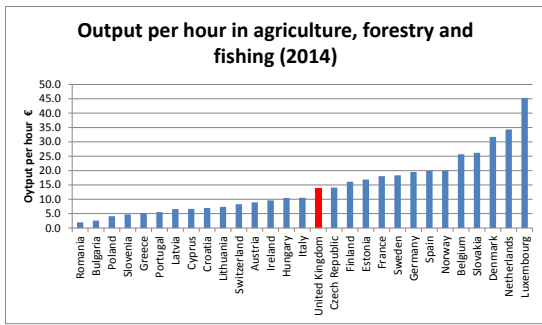


Figure 5: Output per hour by country and industry, 2014<sup>5</sup>

<sup>5</sup> International Comparisons of UK Labour Productivity by Industry, 2014

This suggests the explanation for the UK's productivity puzzle is not something that is limited to a few sectors but is instead a more general issue effecting the economy as a whole. There is much debate and little agreement about what this issue may be, some of the main theories include:

1. Investment - physical investment is very low, including in research and development. The UK's infrastructure is rated second worst among G7 members. Moreover, the UK invests in total 1.7 per cent of GDP in private and public R&D. This is below the OECD average of 2.4 per cent and far behind the leading backers of innovation – South Korea, Israel, Japan, Sweden, Finland and Denmark – which contribute over 3 per cent of their GDP to this area<sup>6</sup>.
2. Skills - skills have an important impact on productivity but in 2011 to 12 the UK's 16 to 18-year olds were the worst performing on literacy and second worst for numeracy out of 18 OECD countries. We also have a shortage of high-skilled technicians below graduate level, only 10 per cent of adults hold technical education as their highest qualification, placing us 16th out of 20 OECD countries<sup>7</sup>.
3. Low interest rates had probably played a role by keeping some heavily indebted, unproductive "zombie" businesses alive. The Bank of England has acknowledged that trade-off, estimating that productivity would have been 1% to 3% higher in the UK had it raised interest rates to pre-crisis levels in the recovery phase. But they believe the consequences – slower income growth and higher unemployment – would have been unacceptable<sup>8</sup>.
4. Labour market- Britain came out of the financial crisis with a relatively low unemployment rate, at least compared with other European countries, and the number of those in work is now at a record high. This has led some to suggest that there is a large degree of spare capacity within firms that is bringing down productivity.

## Gloucestershire's productivity

At a local level productivity is measured in terms of gross value added per worker or per hour worked rather gross domestic product.

In 2016 Gloucestershire's GVA per hour worked was £30.8 this was above the South West average (£29.3) but 5.5% below the UK average (£32.6)<sup>9</sup>. Figure 6 shows that when compared to the other 37 Local Enterprise Partnerships, Gloucestershire has a rank of 14 out of 38 (1 having the highest GVA per hour worked). Of those Local Enterprise Partnerships that have a higher GVA per hour worked than Gloucestershire the majority (10 out of 13) are located in London, South East of East England, the exceptions to these are the West of England LEP, Cheshire and Warrington and Swindon and Wiltshire.

---

<sup>6</sup> Building our Industrial Strategy

<sup>7</sup> *Ibid.*

<sup>8</sup> <http://www.bbc.co.uk/news/business-39332826>

<sup>9</sup> Subregional productivity, ONS

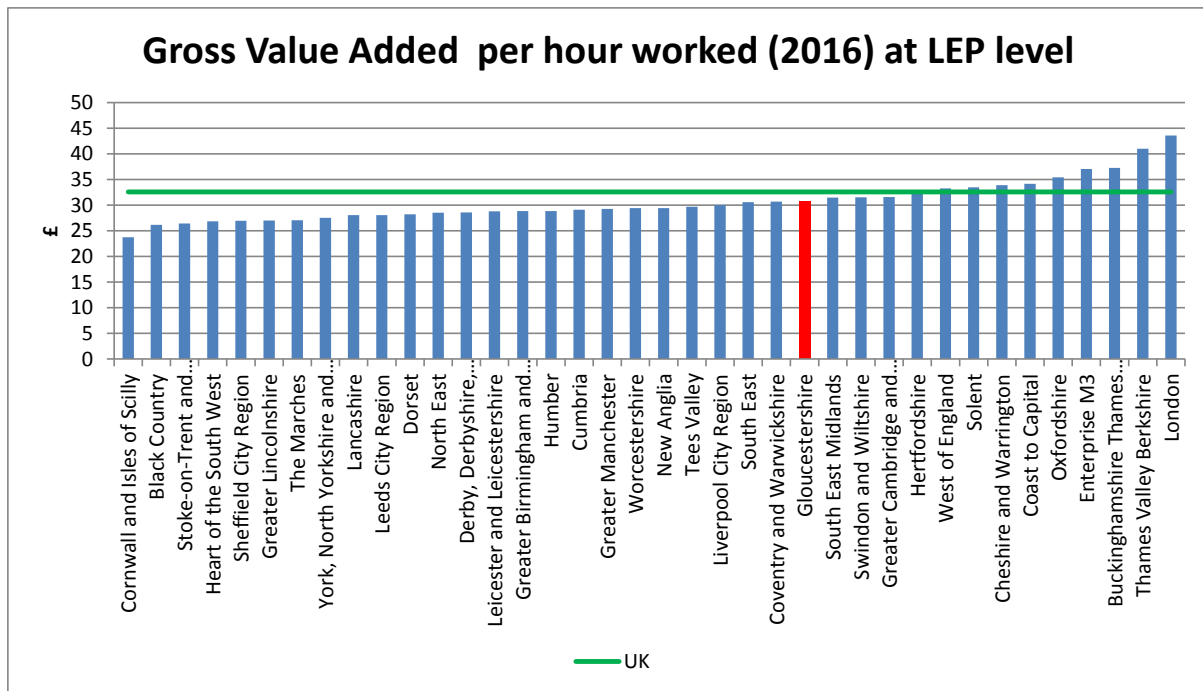


Figure 6: Gross Value Added per hour worked (2016) at LEP level<sup>10</sup>

Gloucestershire GVA per filled job stood at £50,070 in 2016, which as with GVA per hour worked was above the South West average (£45,563) but 4.9% below the national average of (£52,626). The picture when compared with other LEP's is also very similar to that observed with GVA per hour worked, with Gloucestershire again having a rank of 14 out of 38 (1 having the highest GVA prefilled job). Of those Local Enterprise Partnerships that have a higher GVA per filled job than Gloucestershire the majority (10 out of 13) are located in London, South East of East England, the exceptions to these are the West of England LEP, Cheshire and Warrington and Coventry and Warwickshire.

<sup>10</sup> Subregional productivity, ONS

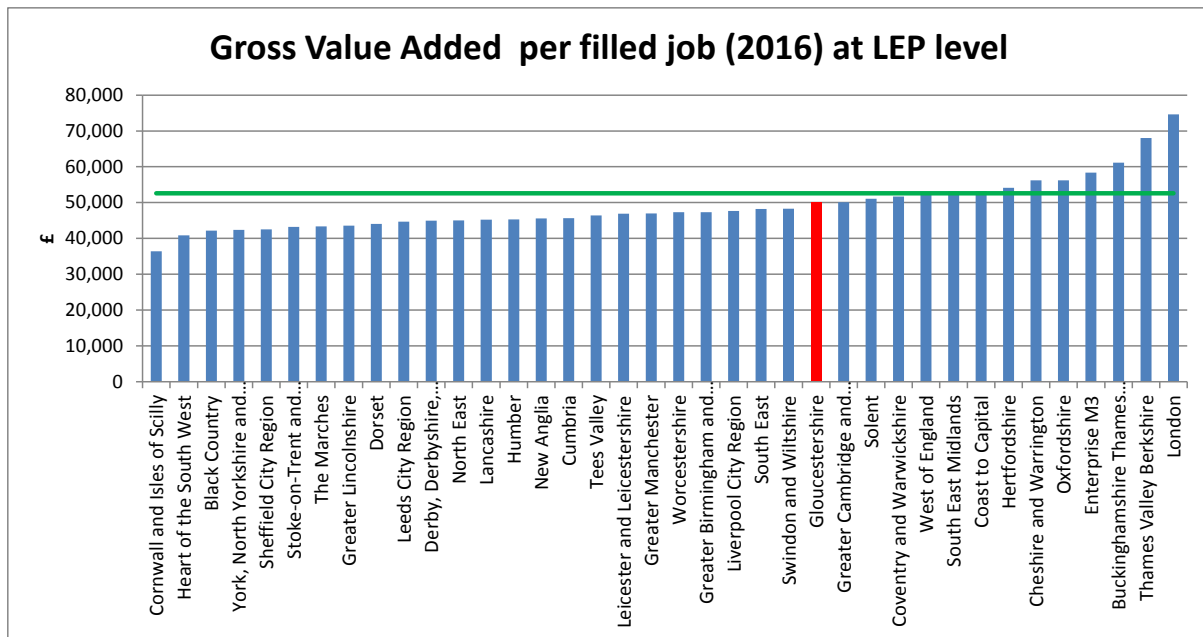


Figure 7: Gross Value Added per filled job (2016) at LEP level<sup>11</sup>

### How has Gloucestershire Productivity changed over time?

Figure 8 and Figure 9 show that Gloucestershire has generally followed the national trend in output per hour worked and per worker with growth in productivity prior to the recession, followed by several years of limited growth, which has since been followed by a return to growth. Interestingly in the run-up to the recession and the years directly following the recession, Gloucestershire’s productivity grew at a slower rate than nationally, this saw a gap develop between productivity in Gloucestershire and the UK average which had not been present in 2004. However, in recent years this gap has been narrowing in terms of GVA per filled job and is fairly steady in terms of GVA per hour worked, which suggests Gloucestershire’s productivity is now growing at a faster rate than nationally. This is supported by Figure 10 and Figure 11, which illustrates the average annual growth rate since 2002/3 and shows that while productivity grew at a lower rate than nationally for a number of year’s pre and post recession, it is now growing at a faster rate. This is particularly apparent when looking at GVA per filled job (Figure 11) with Gloucestershire consistently experiencing greater growth than the UK since 2011-12.

<sup>11</sup> *Ibid.*



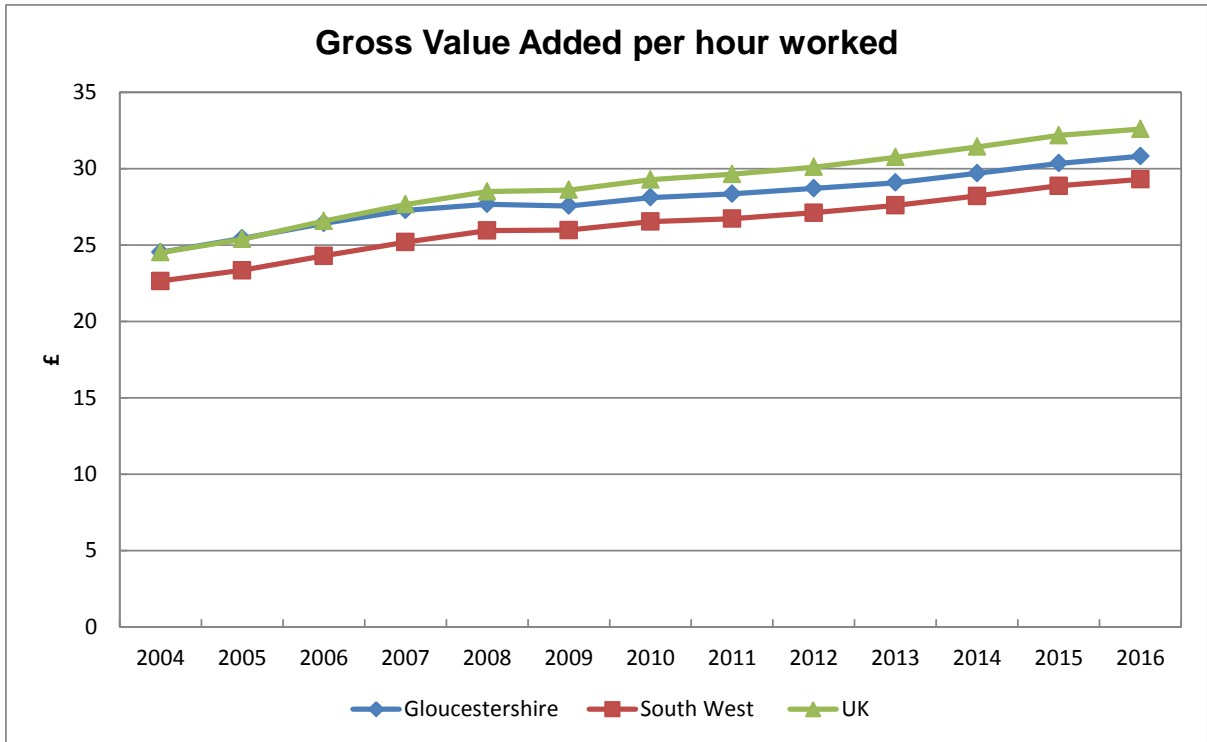


Figure 8: Gross Value Added per hour worked, 2004-2016<sup>12</sup>

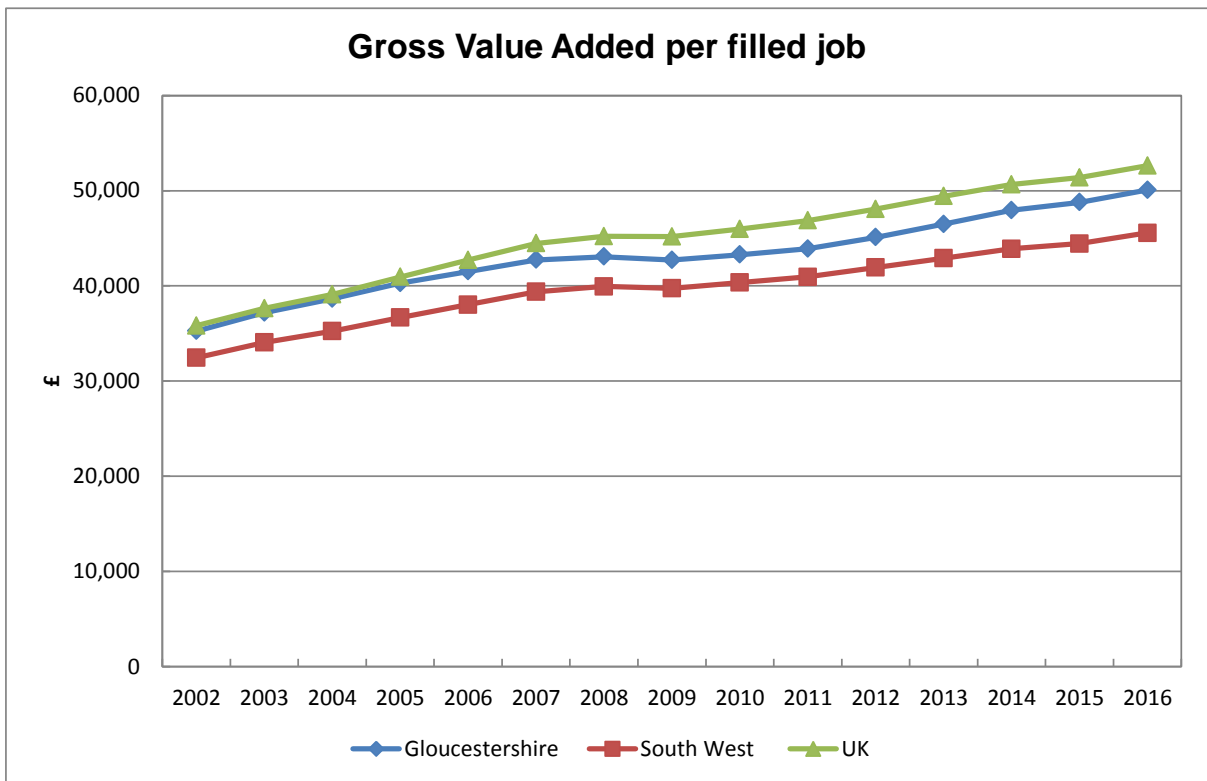


Figure 9: Gross Value Added per filled job, 2004 -2016<sup>13</sup>

<sup>12</sup> Subregional productivity, ONS

<sup>13</sup> *Ibid.*

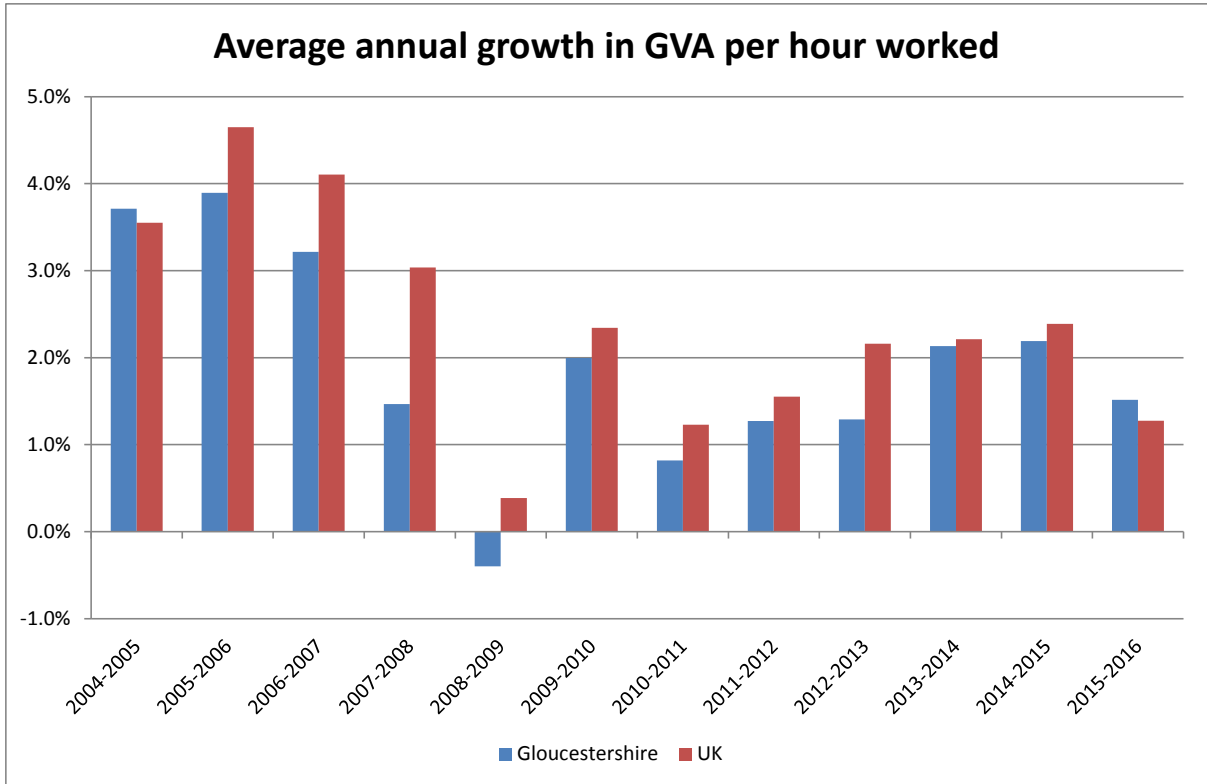


Figure 10: Average annual growth in GVA per hour worked<sup>14</sup>

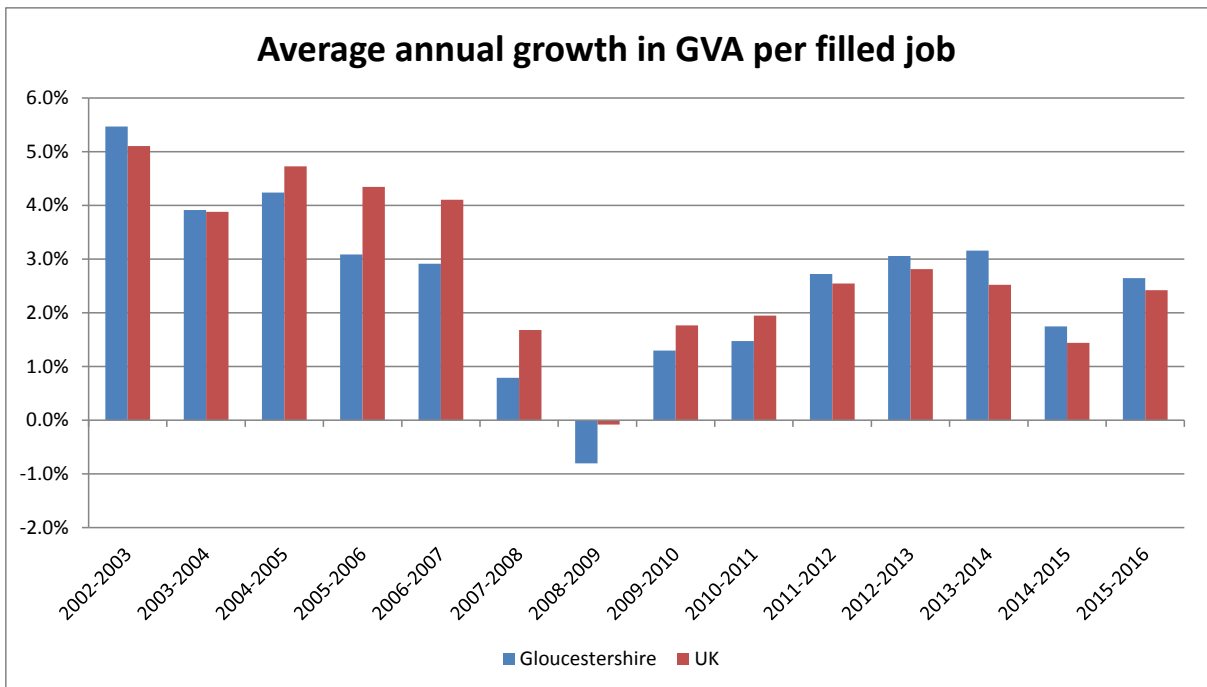


Figure 11: Average annual growth in GVA per filled job<sup>15</sup>

<sup>14</sup> *Ibid.*

<sup>15</sup> *Ibid.*

When compared to the other 37 Local Enterprise Partnerships, Gloucestershire is ranked 23 out of 38 Local Enterprise Partnerships in terms of average annual growth in GVA per hour between 2011 and 2016, as shown in Figure 12. The recent growth in Gloucestershire’s GVA per hour means Gloucestershire’s position relative to other Local Enterprise Partnerships has improved considerably, with Figure 13 showing that when looking at the more recent period of 2015-16 Gloucestershire ranks 9 out of 38 Local Enterprise Partnerships. Figure 14 and Figure 15 illustrate Gloucestershire’s position relative to other Local Enterprise partnerships in regards to growth in GVA per job. Gloucestershire is ranked 6 out of 38 in terms of growth between 2011 and 2016 and 10 out of 38 during the period 2015 and 2016. Gloucestershire’s performance in terms of growth in GVA per job was noticeably better than its performance in terms of GVA per hour worked during the period 2011-2016, this is due to a growth in the proportion of people working full-time which was experienced to a lesser extent by other local enterprise partnerships.

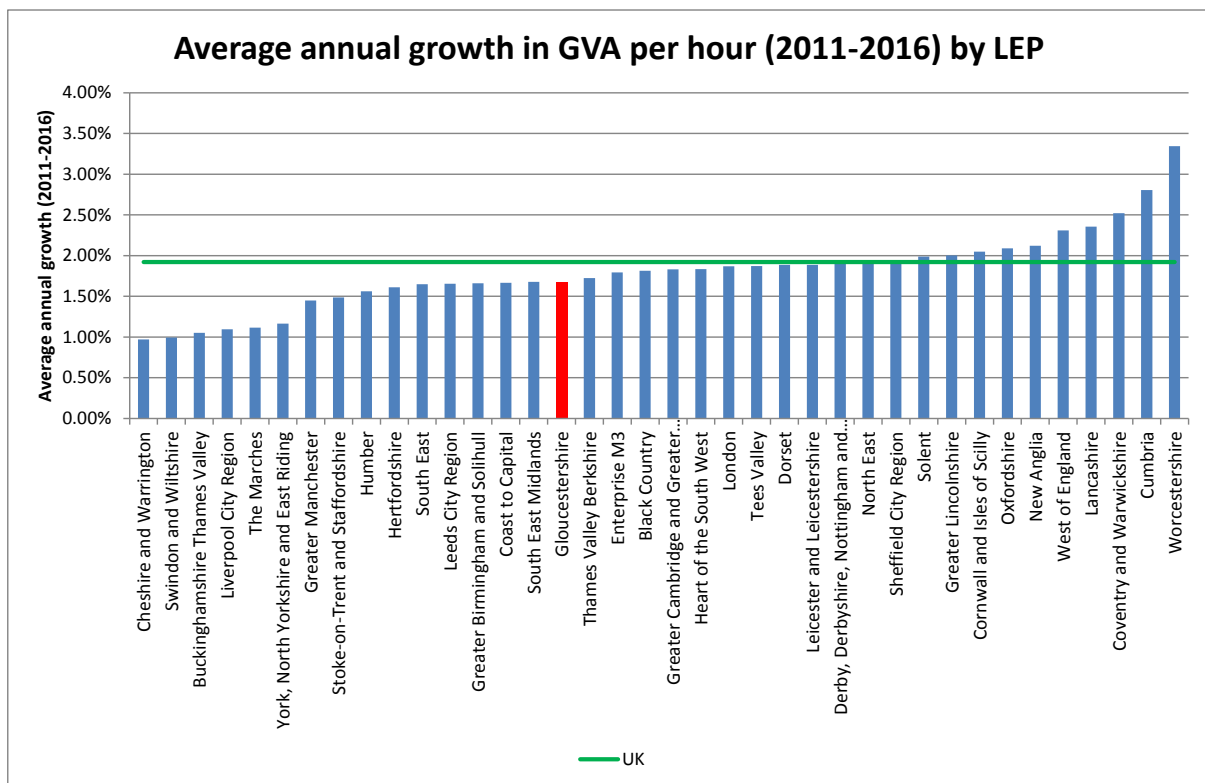


Figure 12: Average annual growth in GVA per hour 2011-2016 by Local Enterprise Partnership<sup>16</sup>

<sup>16</sup> Ibid.

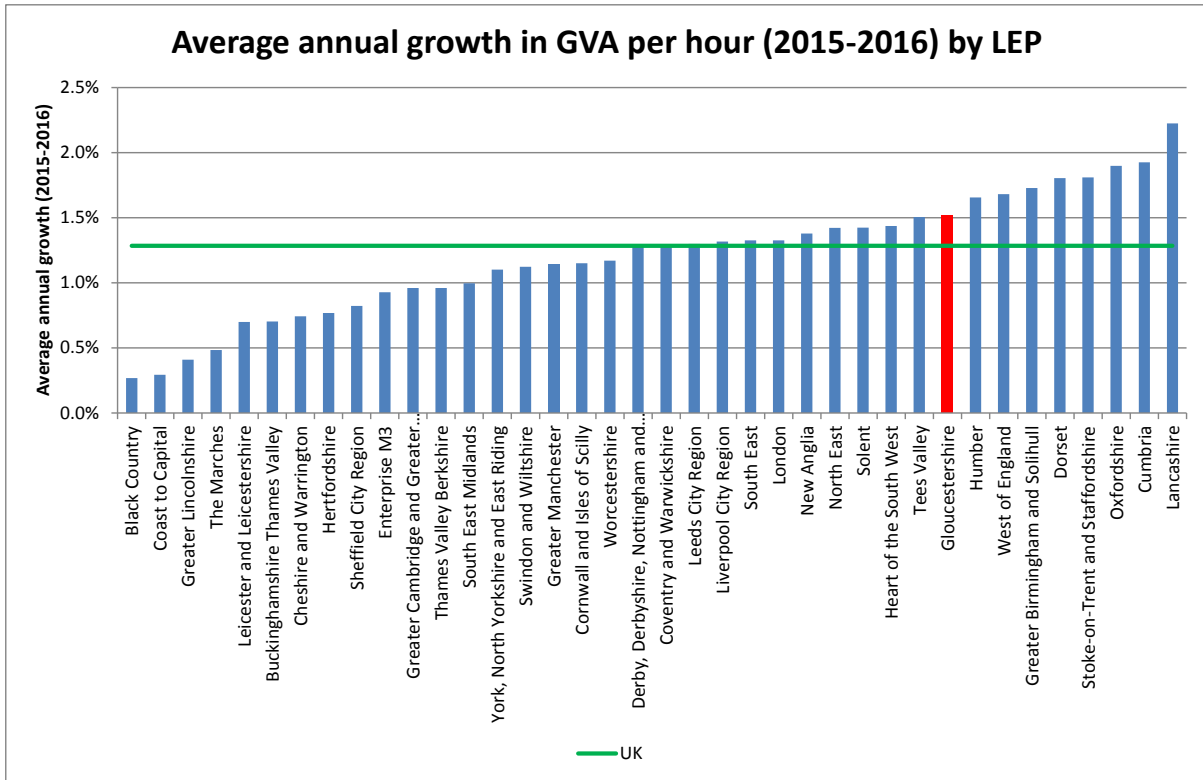


Figure 13: Average annual growth in GVA per hour 2015-2016 by Local Enterprise Partnership<sup>17</sup>

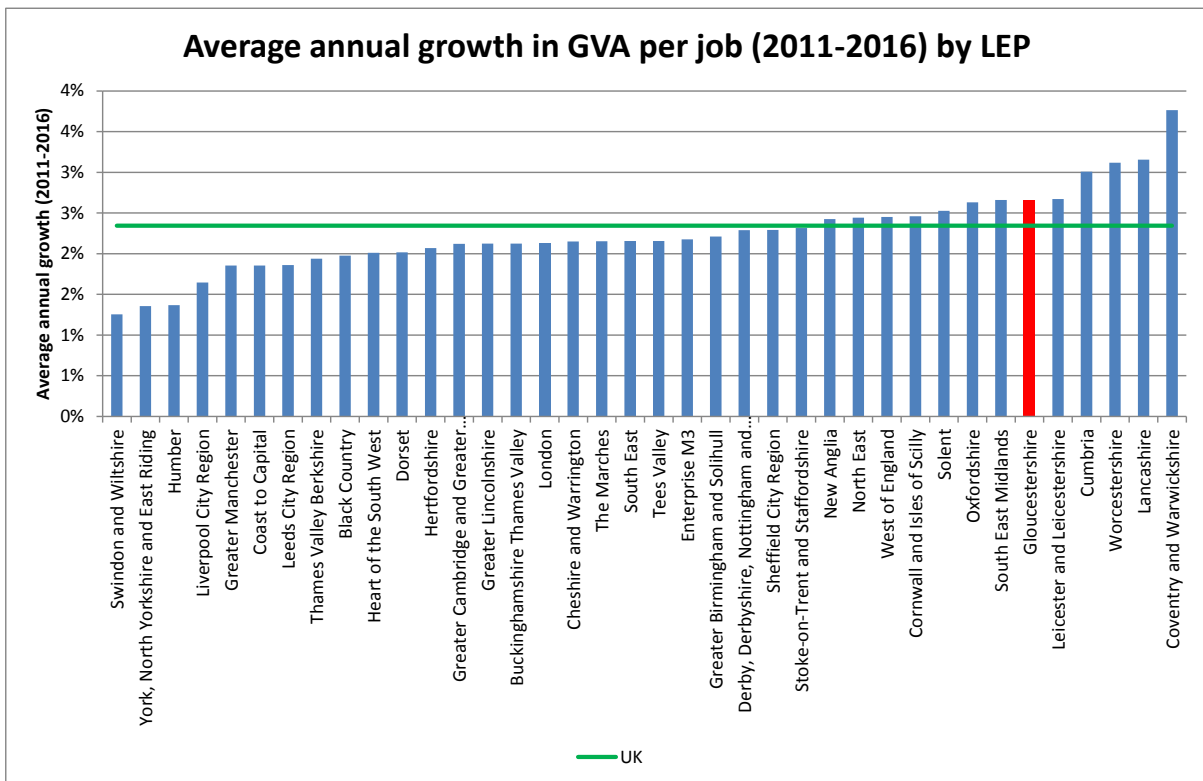


Figure 14: Average annual growth in GVA per job 2011-2016 by Local Enterprise Partnership<sup>18</sup>

<sup>17</sup> Ibid.

<sup>18</sup> Ibid.

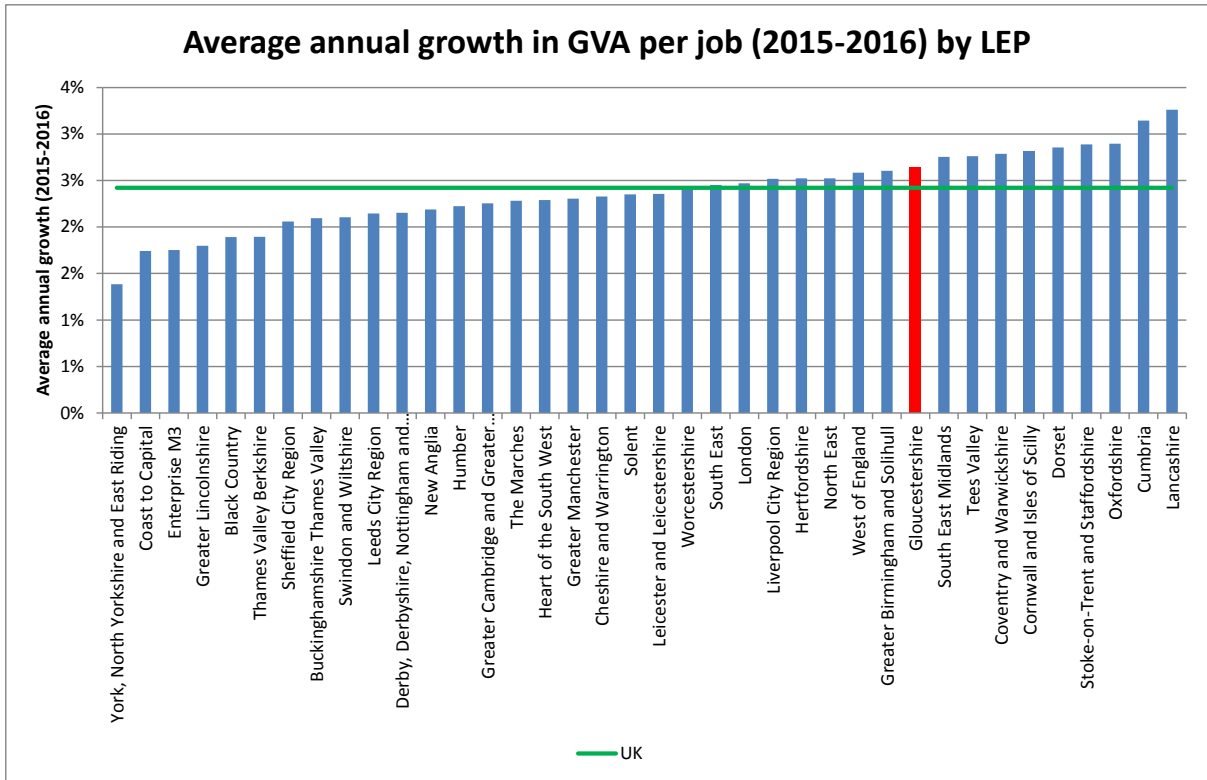


Figure 15: Average annual growth in GVA per job 2015-2016 by Local Enterprise Partnership<sup>19</sup>

Gloucestershire’s performance relative to other local enterprise partnerships in terms of current levels of productivity per hour and growth rates is shown diagrammatically in Figure 16. The axis on the graph crosses at the average size and rate of growth for all local enterprise partnerships. Gloucestershire sits in the bottom left quadrant meaning it is exceeding the average for GVA per hour but experienced slightly lower than average growth between 2011 and 2016. There are only five local enterprise partnerships that exceed the average on both points of consideration.

<sup>19</sup> *Ibid.*

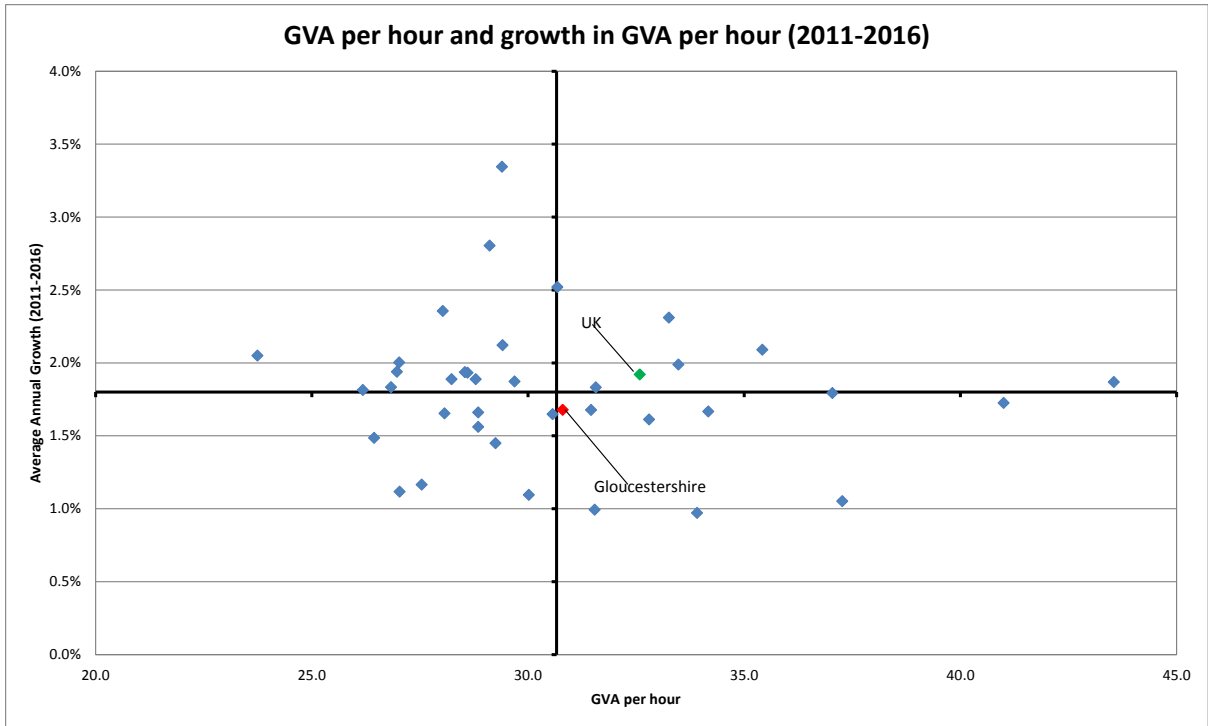


Figure 16: GVA per hour and growth in GVA per hour (2011-2016)<sup>20</sup>

The recent growth in productivity in Gloucestershire observed earlier is particularly highlighted when one looks at a replica graph to the one above, but looking at the period 2015-2016. In this instance Gloucestershire is in the top right quadrant meaning it is one of only five local enterprise partnerships that have exceeded the average in terms of GVA per hour and recent growth.

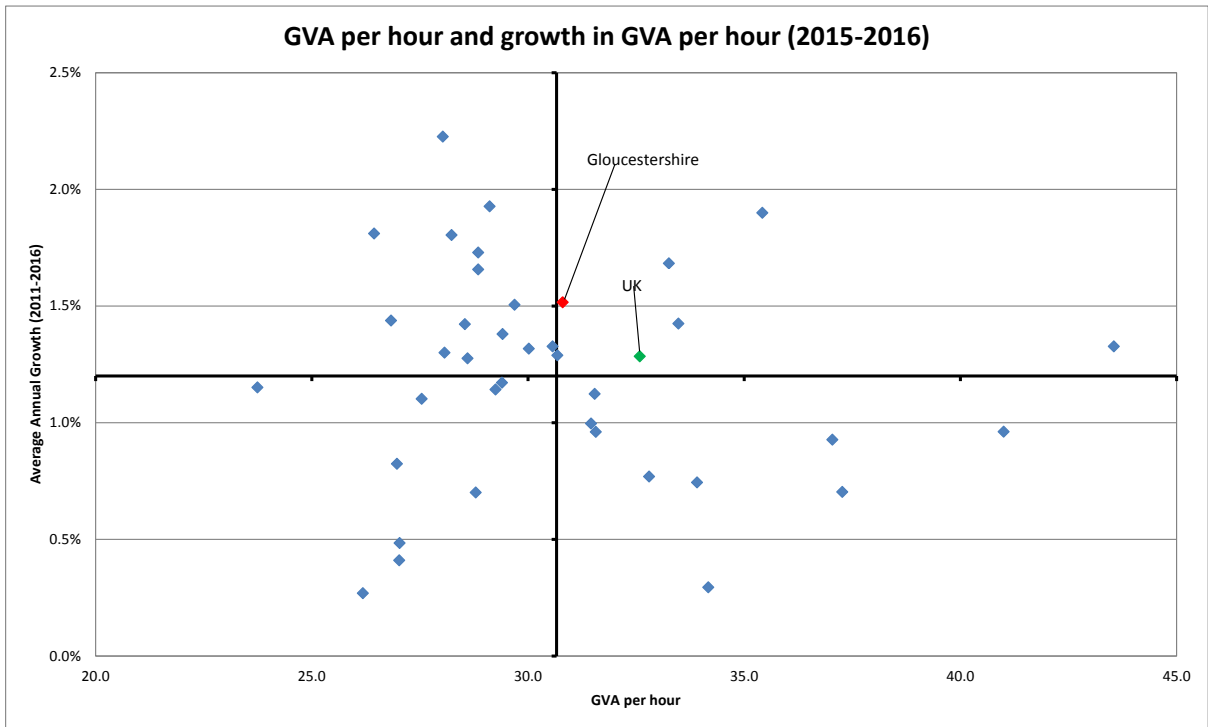


Figure 17: GVA per hour and growth in GVA per hour (2015-2016)<sup>21</sup>

<sup>20</sup> *ibid.*

Gloucestershire's also compares well when looking at productivity per filled job, with Figure 18 and Figure 19 showing that in both the short-term (2015-2016) and longer term (2011-2016) Gloucestershire was one of only a handful of Local Enterprise Partnerships that exceeded the average in terms of growth and GVA per job.

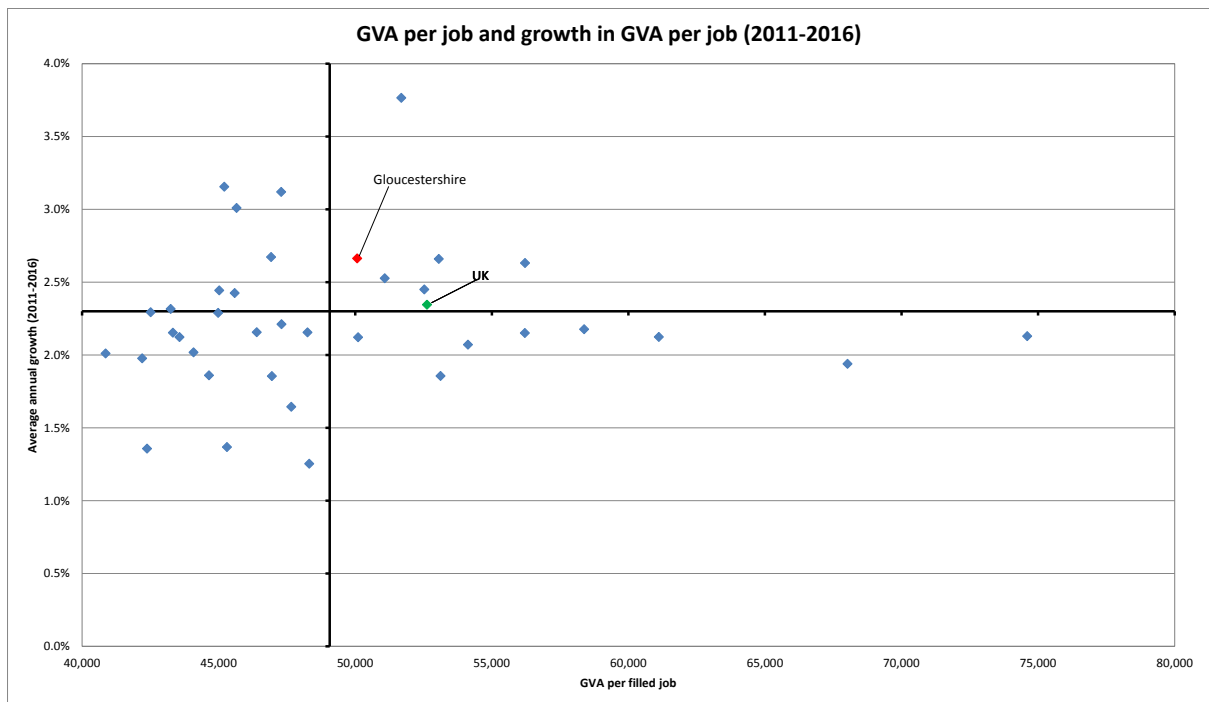


Figure 18: GVA per job and growth in GVA per job (2011-2016)<sup>22</sup>

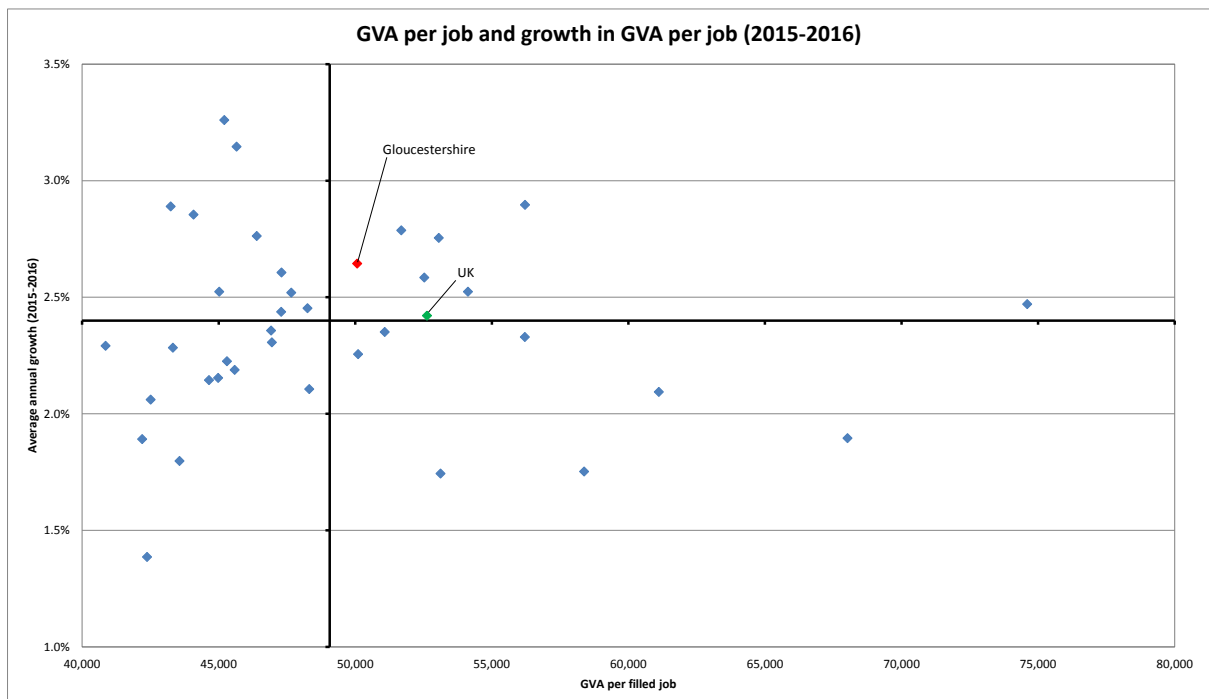


Figure 19: GVA per job and growth in GVA per job (2015-2016)

<sup>21</sup> *Ibid.*

<sup>22</sup> *Ibid.*

Limited information at a local level means it is not possible to identify which sectors are driving Gloucestershire’s productivity growth. However, data does show which sectors have experienced the greatest growth in GVA and higher levels of GVA mean higher productivity if the number of workers and hours remains constant. Figure 20 shows that between 2011 and 2016, all sectors in Gloucestershire experienced growth with the exception of Financial and Insurance activities. The greatest growth was in Agriculture, mining, electricity, gas, water and waste; Construction, Information and Communication; and Other services and household activities, which suggests these sectors may have played a particular role in driving Gloucestershire’s productivity growth.

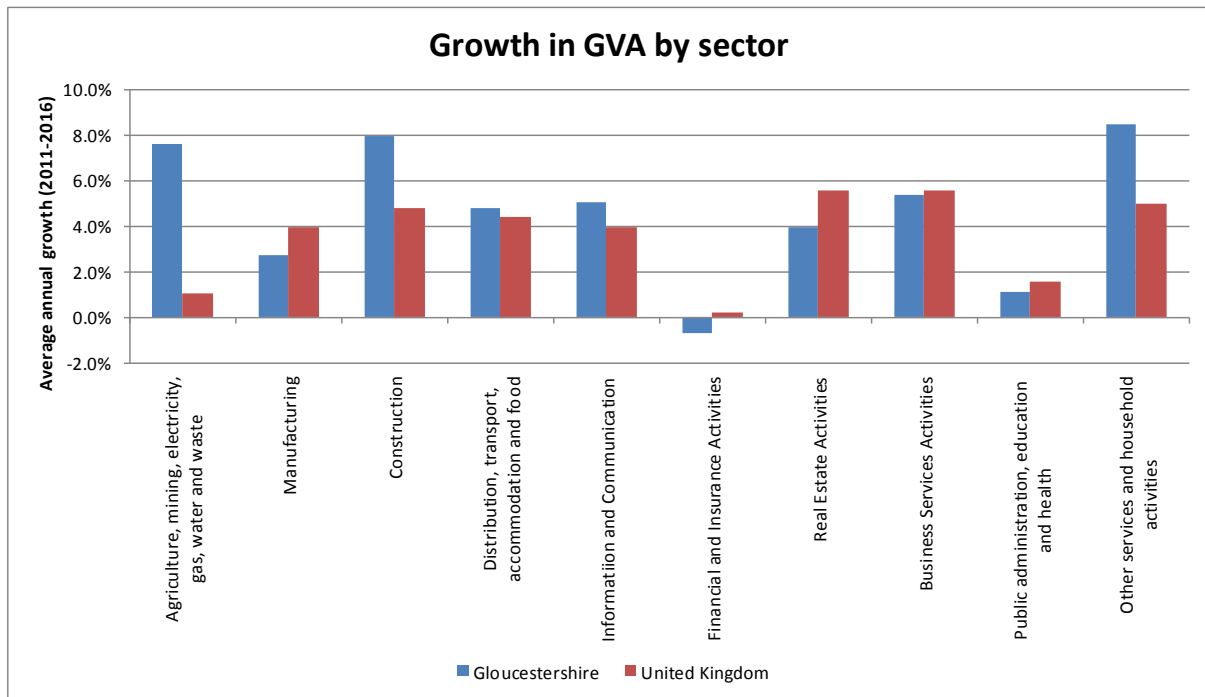


Figure 20: Growth in GVA by sector, 2011-2016<sup>23</sup>

<sup>23</sup> Regional gross value added (balanced) by local enterprise partnership in England, ONS