

Working Paper 87

Productivity Trends: GVA per workforce job estimates for London and the UK, 1997 - 2015

Brian Smith and Aaron Girardi

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For more information about this publication, please contact:

GLA Economics

Tel 020 7983 4922

Email glaeconomics@london.gov.uk

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Executive summary

This paper is an update to Working Paper 63, and provides estimates of Gross Value Added per workforce job for London, the regions and the UK, by industry section and division, through to 2015. Such estimates can be useful when undertaking project appraisal and evaluation to aid the estimation of the total economic impact of projects and programmes. Such analysis can also give insights into the productivity of sectors of the economy.

The latest data finds that the all sector average GVA per workforce job in London was £58,442 in 2015, an increase of 1.3 per cent in nominal terms over the previous year. For the UK as a whole, the all sector average GVA per job was £42,918; and £39,339 for the rest of the UK (excluding London); increases of 1.2 per cent and 1.5 per cent respectively. In constant price terms however, GVA per workforce job in London fell by 0.4 per cent in 2015, and remains below its value in 2010.

1. Introduction

This paper provides an update to Working Paper 63, with updated estimates of Gross Value Added (GVA) per workforce job for London and the UK, through to 2015. The methodology to produce GVA per job estimates at the Standard Industrial Classification 2007 (SIC07) section and division level uses publicly available data from the Office for National Statistics (ONS).

Chapter 2 provides the estimates of GVA per workforce job by sector and division, for both London and the UK. Further data is provided within the accompanying data publication, available on the London Datastore.

This analysis feeds into the wider economic debate relating to labour productivity, where data on total output can be compared to employment, to give an indication of the relative productivity of sectors and also the changing productivity of sectors over time. In Chapter 4, we go further to provide a review of the debate on the current trends in productivity and consider how our analysis can increase our understanding of productivity in London over time.

Finally, Chapter 5 provides the headline conclusions drawn from the data.

Within the appendices, the methodology used to calculate the estimates for London and the UK is set out. In addition, two case studies of how our methodology has been applied are shown. Firstly, an update of our analysis on the creative industries in London, previously shown in Working Paper 70. Second, the application of our methodology for tourism and events.

In terms of a brief summary, the main areas that have been updated as compared to Working Paper 63 include:

- The model used to attribute published GVA to the workforce has been amended to account for more data being made publicly available. As a result, the model is now identical for regions and the UK as a whole. These changes are outlined in Appendix A.
- Data at the 1 digit SIC section level is now available through to 2015.
- Data for Section T “Activities of households as employers” has been included as data have become available.
- GVA per workforce job estimates at the 2 digit SIC division level are provided for all regions for 2015, where data are available.

2. GVA per workforce job estimates

This chapter provides the estimates of GVA per workforce job, by industry section and division for London, regions and the UK as a whole. Further detail, such as time series and other data are available within Appendix C and also available on the London Datastore. The methodology used to calculate the GVA attributable to the workforce and the final estimates of GVA per workforce job are included in Appendix A.

Table 2.1 London estimates, 1 digit SIC sections, 2015

	Sector Description	Published GVA (£ million)	Attributable GVA (£ million)	Four quarter Workforce Job Average	GVA per workforce job (£)
A	Agriculture, Forestry and Fishing	62	61	1,500	£40,409
B	Mining and Quarrying	202	189	3,750	£50,433
C	Manufacturing	8,398	8,195	121,750	£67,310
D	Electricity, Gas, Steam and Air Conditioning Supply	3,082	3,030	9,250	£327,606
E	Water Supply, Sewerage, Waste Management	1,445	1,423	16,000	£88,950
F	Construction	16,020	14,828	288,250	£51,441
G	Wholesale and Retail Trade, Repair of Motor Vehicles	31,310	30,797	672,500	£45,795
H	Transportation and Storage	17,872	17,749	281,500	£63,052
I	Accommodation and Food Service	11,398	11,270	377,250	£29,875
J	Information and Communication	41,110	40,851	433,250	£94,290
K	Financial and Insurance Activities	61,703	59,514	373,250	£159,447
L	Real Estate	53,604	9,548	137,750	£69,314
M	Professional, Scientific and Technical Activities	43,742	43,520	767,000	£56,741
N	Administrative and Support Services	21,879	21,581	574,750	£37,548
O	Public Administration and Defence	12,021	12,021	223,750	£53,725
P	Education	17,715	17,657	420,500	£41,990
Q	Human Health and Social Work	20,859	20,786	546,750	£38,017
R	Arts, Entertainment and Recreation	6,846	6,813	202,000	£33,728
S	Other Service Activities	7,116	7,085	146,750	£48,277
T	Activities of households	2,041	2,041	12,750	£160,078
A-T	Overall	378,424	327,860	5,610,000	£58,442

Table 2.2 UK estimates, 1 digit SIC sections, 2015

	Sector Description	Published GVA (£ million)	Attributable GVA (£ million)	Four quarter Workforce Job Average	GVA per workforce job (£)
A	Agriculture, Forestry and Fishing	10,833	10,112	385,500	£26,230
B	Mining and Quarrying	16,947	16,904	70,250	£240,633
C	Manufacturing	162,829	162,129	2,631,750	£61,605
D	Electricity, Gas, Steam and Air Conditioning Supply	24,824	24,632	134,750	£182,798
E	Water Supply, Sewerage, Waste Management	16,708	16,631	197,000	£84,421
F	Construction	101,937	97,026	2,157,500	£44,971
G	Wholesale and Retail Trade, Repair of Motor Vehicles	182,510	180,587	5,027,500	£35,920
H	Transportation and Storage	77,103	76,635	1,604,000	£47,778
I	Accommodation and Food Service	49,674	49,189	2,246,500	£21,896
J	Information and Communication	108,474	107,477	1,380,000	£77,882
K	Financial and Insurance Activities	120,351	111,892	1,108,750	£100,917
L	Real Estate	216,115	27,597	561,000	£49,192
M	Professional, Scientific and Technical Activities	124,730	123,867	2,929,750	£42,279
N	Administrative and Support Services	80,398	79,247	2,900,000	£27,327
O	Public Administration and Defence	78,548	78,548	1,487,500	£52,805
P	Education	98,025	97,803	2,960,000	£33,041
Q	Human Health and Social Work	130,723	130,442	4,226,750	£30,861
R	Arts, Entertainment and Recreation	22,983	22,858	977,000	£23,396
S	Other Service Activities	35,585	35,463	910,000	£38,970
T	Activities of households	7,045	7,045	64,500	£109,225
A-T	Overall	1,666,342	1,457,503	33,960,500	£42,918

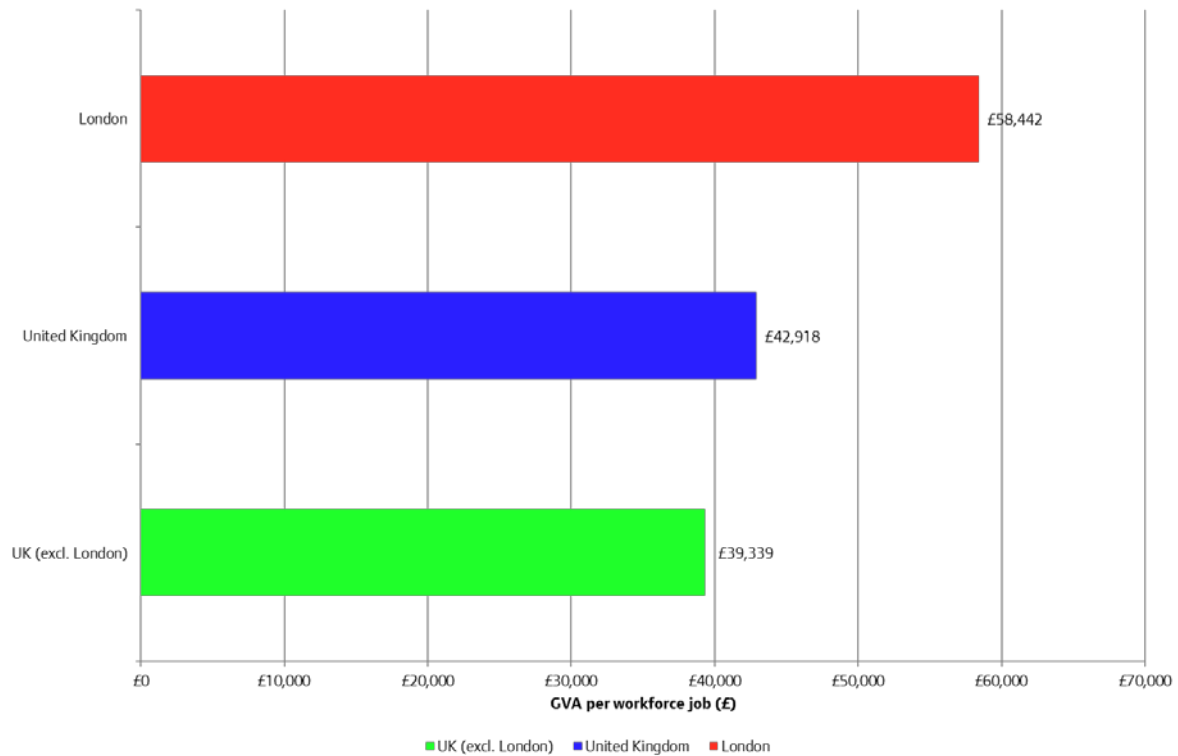
2.1 Comparisons between London, regions and the UK

The estimates produced allow for comparative analysis of the GVA per workforce job by sector for London and the rest of the UK¹.

Figure 2.1 provides the headline comparison of GVA per workforce job for London, the rest of the UK, and the UK as a whole; with the London estimate being 36.2 per cent higher than for the UK as a whole.

¹ "Rest of UK" refers to the UK (excluding extra-regio) less London and equates to the sum of all, other regions and countries in the UK (allowing for rounding).

Figure 2.1: GVA per workforce job, London and the UK, all sector average, 2015



Source: GLA Economics calculations

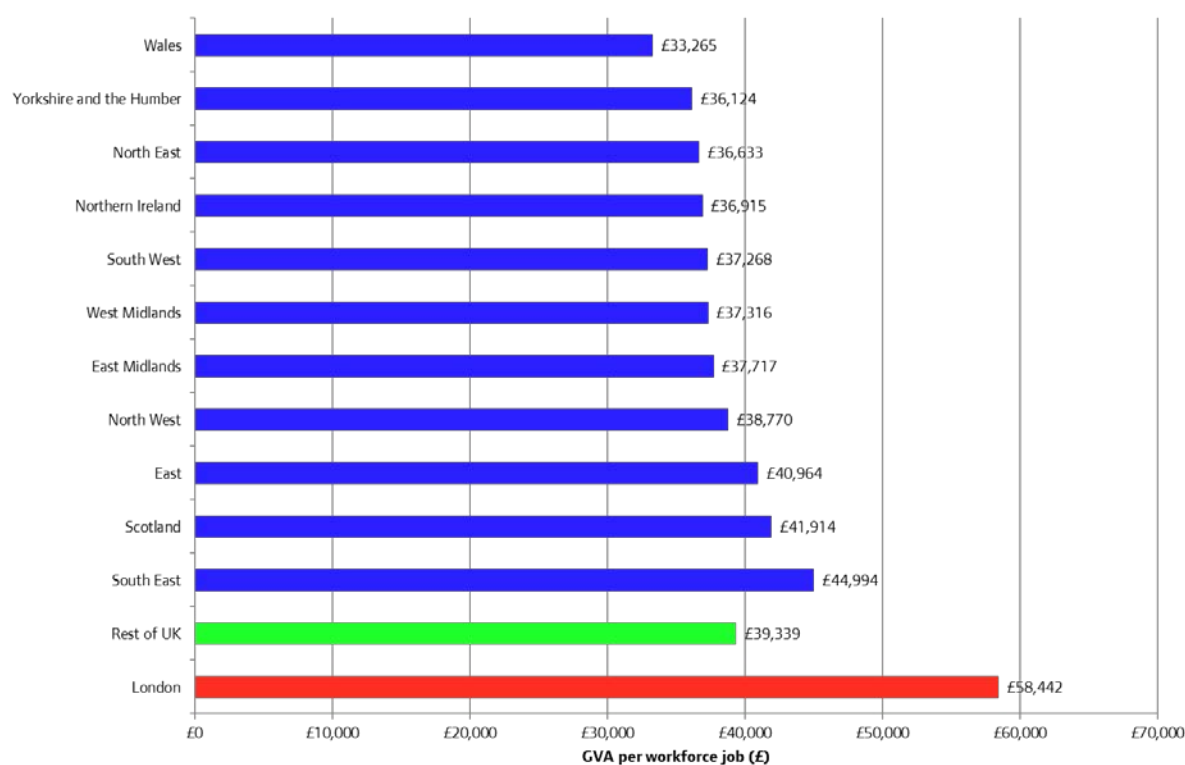
Table 2.3 and Figure 2.2 provide estimates for average GVA per workforce job for each region and country within the UK. However, it should be made clear that these estimates for individual regions and countries within the UK, when aggregated together, do not sum to the total published GVA for the UK, since “extra-regio” output (that which cannot be assigned to individual regions/countries) has not been included or apportioned to individual regions/countries. The calculation for “Rest of UK” used here is United Kingdom excluding extra-regio minus London.

Table 2.3: GVA per workforce job estimates by region/country within the UK, 2015

Region	Published GVA (£ million)	Attributable GVA (£ million)	Four Quarter Average Workforce Jobs	GVA per workforce job (£)
North East	49,677	43,941	1,199,500	36,633
North West	156,872	138,759	3,579,000	38,770
Yorkshire and the Humber	109,704	96,605	2,674,250	36,124
East Midlands	97,887	86,541	2,294,500	37,717
West Midlands	119,769	105,557	2,828,750	37,316
East	145,651	125,678	3,068,000	40,964
London	378,424	327,860	5,610,000	58,442
South East	249,174	215,206	4,783,000	44,994
South West	126,007	107,592	2,887,000	37,268
Wales	55,788	48,384	1,454,500	33,265
Scotland	127,260	114,016	2,720,250	41,914
Northern Ireland	34,410	31,313	848,250	36,915
Rest of UK	1,272,198	1,115,293	28,350,500	39,339

Source: Regional Gross Value Added (Income Approach), published data refers to sections A-T.

Figure 2.2: GVA per workforce job estimates by region/country within the UK, 2015



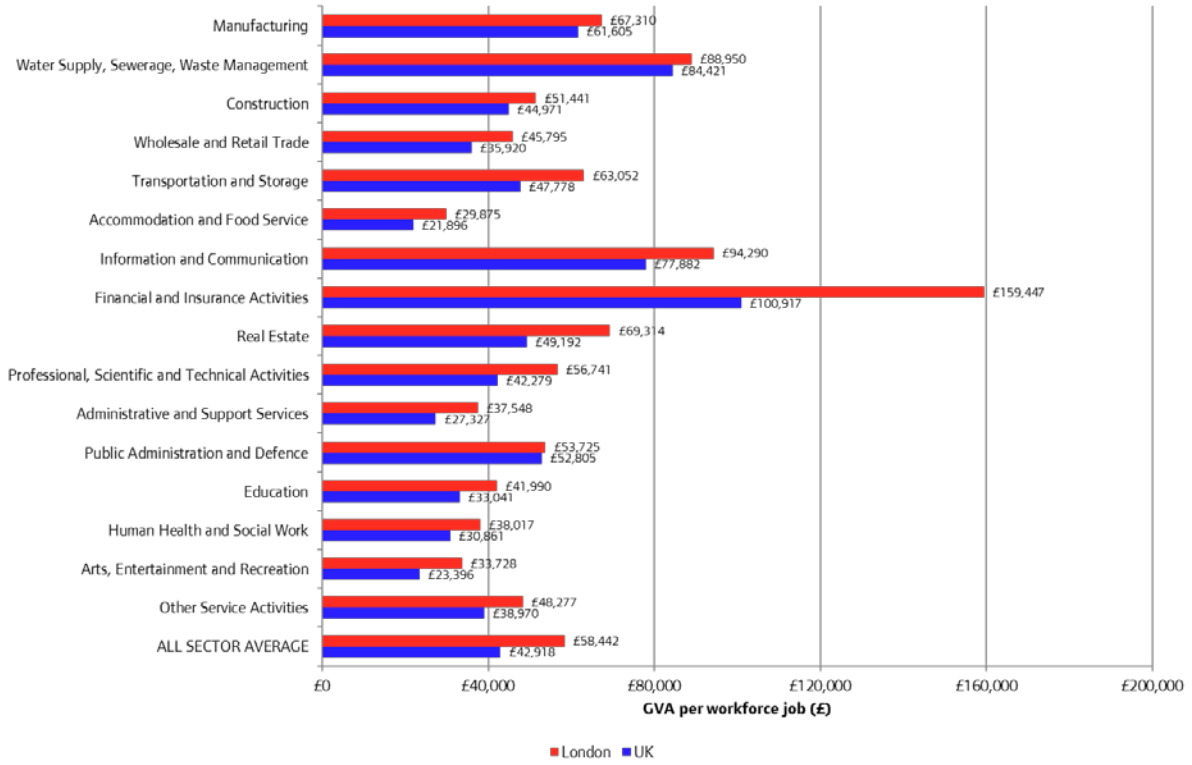
Source: GLA Economics calculations. Rest of UK equals UK excluding extra-regio minus London.

Figure 2.2 shows that GVA per workforce job estimates for London are significantly higher than for any other region; compared to the South East, GVA per workforce job is 29.9 per cent higher; and compared to Wales, London's estimate is 75.7 per cent higher. When looking at the

UK excluding London, GVA per workforce job is estimated to be £39,339; with London’s GVA per workforce job 48.6 per cent higher.

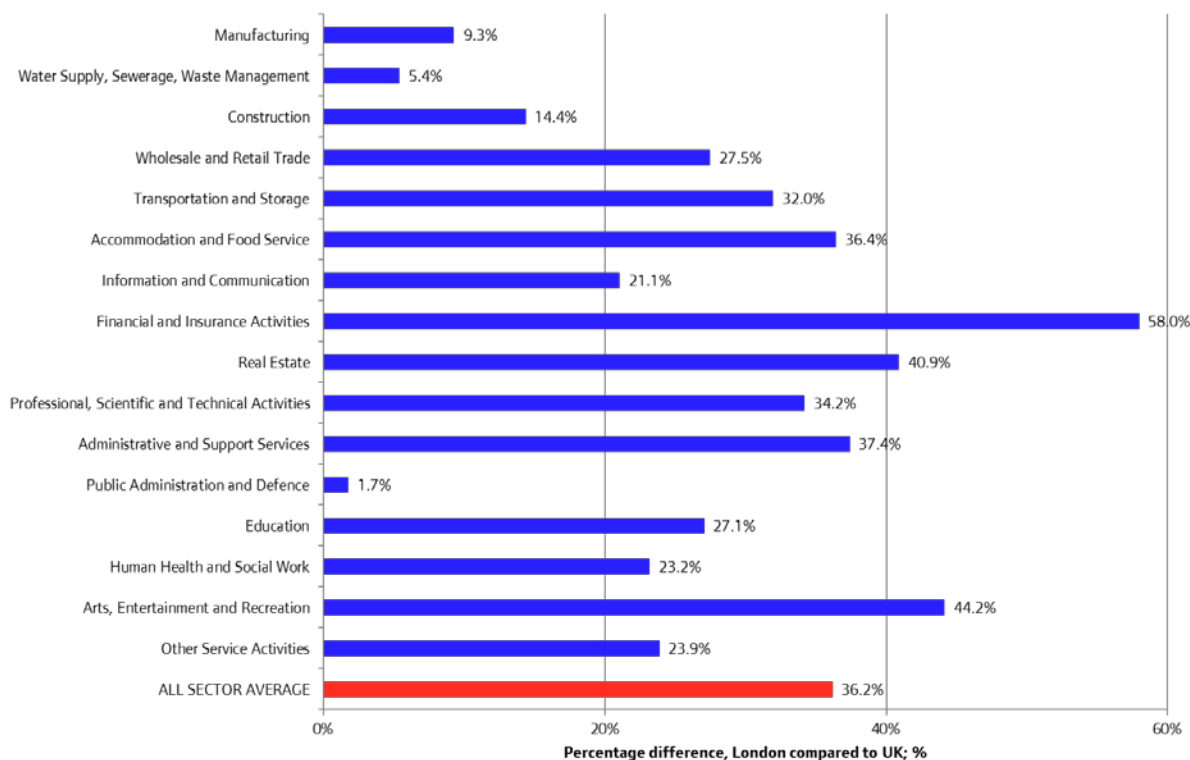
Figure 2.3 details comparisons in the estimates between industry sectors for London and the UK as a whole:

Figure 2.3: GVA per workforce job, by industry sector, London and the UK, 2015



Source: GLA Economics calculations. Note: Chart here does not include Sections A, B, D and T.

Figure 2.4: Percentage difference in GVA per workforce job estimates by industry sector, London compared to UK, 2015



Source: GLA Economics calculations. Note: Chart here does not include Sections A, B, D and T.

Figures 2.3 and 2.4 present the estimates and comparisons of GVA per workforce job for London and the UK. Sections A, B, D and T have been excluded in the analysis since they represent either only a very small proportion of the London economy (ie, agriculture), or where such activities do not physically occur in London, however the output may be recorded in London (ie, mining and quarrying; electricity, gas, steam and air conditioning supply).

For all sections of the economy, the GVA per workforce job in London is higher than for the UK as a whole. As a general conclusion this is perhaps not surprising, since other measures of output or earnings would suggest this is the case.

Sectors where there are particular comparative advantages for London (and greater disparity between earnings of London compared to the UK as a whole) show the greatest differences. For instance, as shown in Figure 2.4, the largest difference between London and the UK was in the Financial and Insurance Activities section (58.0 per cent higher in London than in the UK as a whole). Large differences were also observed in the Arts, Entertainment and Recreation (44.2 per cent); and Real Estate (40.9 per cent). Within Public Administration and Defence; and the Water Supply, Sewerage and Waste Management sectors, Figure 2.4 shows that the differences are lower in magnitude, ranging between 2 and 5 per cent higher in London than in the UK as a whole.

2.2 Industry Division (2 digit SIC) estimates

This section of the chapter provides detail of the estimates for GVA per workforce job for all divisions within sections for 2015, ie, more detailed sector characterisations within the broad sector. Full details of the calculation steps within this methodology are not provided for some divisions due to suppression of data obtained from BRES. Full details, where available, are included in Appendix E.

Data for Real Estate activities, Public Administration and Defence, and Education have not been presented within this chapter since there is only one division within the section, therefore the estimates have already been provided within Chapter 2.

Primary and Utilities

Due to the small size of these sectors in London and the limitations of the data, care must be used in the interpretation of these statistics. For example, very limited agricultural activity is physically able to take place in London compared to the UK as a whole, therefore the London estimate cannot be considered reliable data; therefore for sections A, B and D; data has not been included. Estimates for divisions within Section E are shown in the table below.

Division	GVA per workforce job estimate (£)		Percentage Difference: London compared to UK
	London	UK	
E 36: Water collection, treatment and supply	87,891	141,317	-38%
E 37: Sewerage	92,070	200,093	-54%
E 38: Waste collection, treatment and disposal activities	88,016	47,279	+86%
E 39: Remediation activities and other waste management services	87,891	47,279	+86%

Sources: GLA Economics calculations using BRES, APS, ASHE and Regional GVA releases. Note for Divisions 38 and 39 for the UK, due to lack of available employment data for these divisions individually, these two codes have been combined and given the same GVA per workforce job estimate.

Manufacturing

	Division	GVA per workforce job estimate (£)		Percentage Difference: London compared to UK
		London	UK	
C	10: Manufacture of food products	55,258	50,470	+9%
C	13: Manufacture of textiles	50,239	41,405	+21%
C	14: Manufacture of wearing apparel	50,328	66,718	-25%
C	15: Manufacture of leather and related products	71,795	57,159	+26%
C	16: Manufacture of wood and products of wood and cork	48,177	30,550	+58%
C	17: Manufacture of paper and paper products	61,667	73,173	-16%
C	18: Printing and reproduction of recorded media	65,700	37,028	+77%
C	20: Manufacture of chemicals and chemical products	77,442	101,939	-24%
C	21: Manufacture of basic pharmaceutical products and preparations	71,795	309,950	-77%
C	22: Manufacture of rubber and plastic products	71,750	42,547	+69%
C	23: Manufacture of other non-metallic mineral products	55,841	51,613	+8%
C	24: Manufacture of basic metals	71,795	39,467	+82%
C	25: Manufacture of fabricated metal products, except machinery	63,773	51,603	+24%
C	26: Manufacture of computer, electronic and optical products	114,997	71,590	+61%
C	27: Manufacture of electrical equipment	64,983	51,041	+27%
C	28: Manufacture of machinery and equipment (other)	66,193	58,639	+13%
C	29: Manufacture of motor vehicles, trailers and semi-trailers	101,177	90,674	+12%
C	30: Manufacture of other transport equipment	71,840	62,766	+14%
C	31: Manufacture of furniture	63,683	51,952	+23%
C	32: Other manufacturing	60,681	46,526	+30%
C	33: Repair and installation of machinery and equipment	101,732	48,525	+110%
	Manufacturing	67,310	61,605	+9%

Construction

	Division	GVA per workforce job estimate (£)		Percentage Difference: London compared to UK
		London	UK	
F	41: Construction of buildings	56,704	56,837	0%
F	42: Civil engineering	53,239	87,161	-39%
F	43: Specialised construction activities	46,446	30,392	+53%
	Construction	51,441	44,971	+14%

Wholesale and Retail Trade

	Division	GVA per workforce job estimate (£)		Percentage Difference: London compared to UK
		London	UK	
G	45: Wholesale and retail trade and repair of motor vehicles/cycles	37,097	53,832	-31%
G	46: Wholesale trade, except of motor vehicles/cycles	58,199	45,695	+27%
G	47: Retail trade, except of motor vehicles/cycles	42,388	28,737	+48%
	Wholesale and Retail Trade	45,795	35,920	+27%

Transportation and Storage

	Division	GVA per workforce job estimate (£)		Percentage Difference: London compared to UK
		London	UK	
H	49: Land transport and transport via pipelines	58,819	42,794	+37%
H	50: Water transport	85,452	382,231	-78%
H	51: Air transport	85,893	129,656	-34%
H	52: Warehousing and support activities for transportation	65,130	35,394	+84%
H	53: Postal and courier activities	49,699	38,113	+30%
	Transportation and Storage	63,052	47,778	+32%

Accommodation and Food

	Division	GVA per workforce job estimate (£)		Percentage Difference: London compared to UK
		London	UK	
I	55: Accommodation	34,462	29,387	+17%
I	56: Food and beverage service activities	28,942	19,724	+47%
	Accommodation and food service activities	29,875	21,896	+36%

Information and Communication

	Division	GVA per workforce job estimate (£)		Percentage Difference: London compared to UK
		London	UK	
J	58: Publishing activities	91,714	63,025	+46%
J	59: Motion picture, video and television programme production, sound and music publishing activities	81,506	88,432	-8%
J	60: Programming and broadcasting activities	100,407	109,238	-8%
J	61: Telecommunications	95,383	134,988	-29%
J	62: Computer programming, consulting and related activities	97,377	59,410	+64%
J	63: Information service activities	102,242	76,017	+34%
	Information and communication	94,290	77,882	+21%

Financial and Insurance Activities

	Division	GVA per workforce job estimate (£)		Percentage Difference: London compared to UK
		London	UK	
K	64: Financial service activities, except insurance and pension funding	173,154	111,157	+56%
K	65: Insurance, reinsurance and pension funding, except compulsory social security	132,010	303,674	-57%
K	66: Activities auxiliary to financial services and insurance	147,455	44,817	+229%
	Financial and Insurance Activities	159,447	100,917	+58%

Professional, Scientific and Technical Activities

	Division	GVA per workforce job estimate (£)		Percentage Difference: London compared to UK
		London	UK	
M	69: Legal and accounting activities	62,301	56,503	+10%
M	70: Activities of head offices; management consultancy activities	61,784	25,843	+139%
M	71: Architectural and engineering activities; technical testing	49,360	43,524	+13%
M	72: Scientific research and development	58,279	64,569	-10%
M	73: Advertising and market research	49,090	55,871	-12%
M	74: Other professional, scientific and technical activities	42,754	30,174	42%
M	75: Veterinary activities	40,822	43,931	-7%
	Professional, Scientific and Technical Activities	56,741	42,279	+34%

Administrative and support service activities

	Division	GVA per workforce job estimate (£)		Percentage Difference: London compared to UK
		London	UK	
N	77: Rental and leasing activities	37,593	94,902	-60%
N	78: Employment activities	37,646	17,568	+114%
N	79: Travel agency, tour operator and other reservation services	56,242	98,542	-43%
N	80: Security and investigation activities	26,195	15,565	+68%
N	81: Services to buildings and landscape activities	30,262	10,118	+199%
N	82: Office administrative, office support and other business support	53,861	42,714	+26%
	Administrative and support service activities	37,548	27,327	+37%

Human health and social work activities

	Division	GVA per workforce job estimate (£)		Percentage Difference: London compared to UK
		London	UK	
Q	86: Human health activities	43,533	41,311	+5%
Q	87: Residential care activities	26,002	19,860	+31%
Q	88: Social work activities without accommodation	31,320	16,855	+86%
	Human health and social work activities	38,017	30,861	+23%

Arts, entertainment and recreation

	Division	GVA per workforce job estimate (£)		Percentage Difference: London compared to UK
		London	UK	
R	90: Creative, arts and entertainment activities	40,748	22,667	+80%
R	91: Libraries, archives, museums and other cultural activities	32,328	26,634	+21%
R	92: Gambling and betting activities	21,628	107,075	-80%
R	93: Sports activities and amusement and recreation activities	29,535	8,062	+266%
	Arts, entertainment and recreation	33,728	23,396	+44%

Other service activities

	Division	GVA per workforce job estimate (£)		Percentage Difference: London compared to UK
		London	UK	
S	94: Activities of membership organisations	59,671	51,014	+17%
S	95: Repair of computers and personal and household goods	51,723	31,016	+67%
S	96: Other personal service activities	35,855	33,942	+6%
	Other service activities	48,277	38,970	+24%

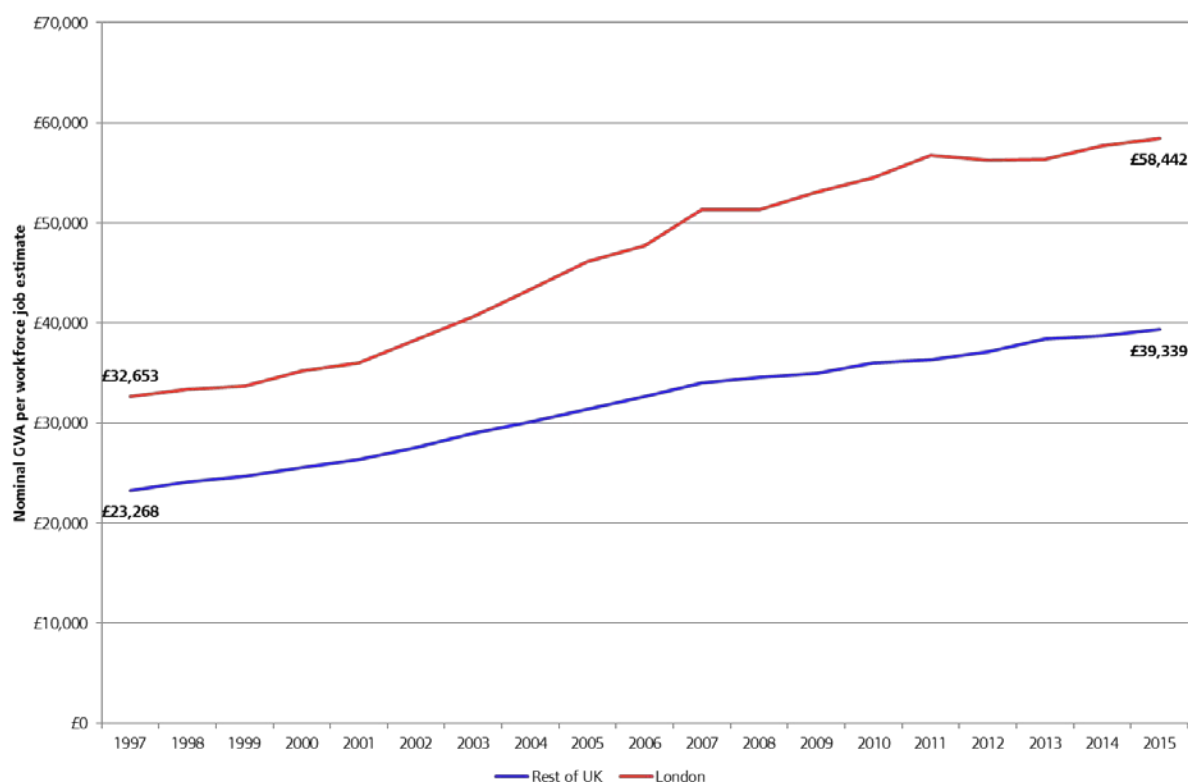
3. Productivity trends – How our estimates of GVA per workforce job add to our understanding of productivity

In this chapter of the paper, we consider how our estimates of GVA per workforce job can feed into the ongoing debate into the recent trends in productivity. Our estimates have a time series running from 1997 – 2015, by region and industrial section and as such the correlations with official productivity statistics can be observed, as well as insights drawn into the productivity of certain parts of London’s (and the UK’s) economy.

3.1 Current trends in productivity

GVA per workforce job has grown strongly over the time series of 1997 – 2015 as shown in Figure 3.1. In nominal terms since 1997, GVA per workforce job has grown by 71.1 per cent compared to 69.1 per cent for the rest of the UK.

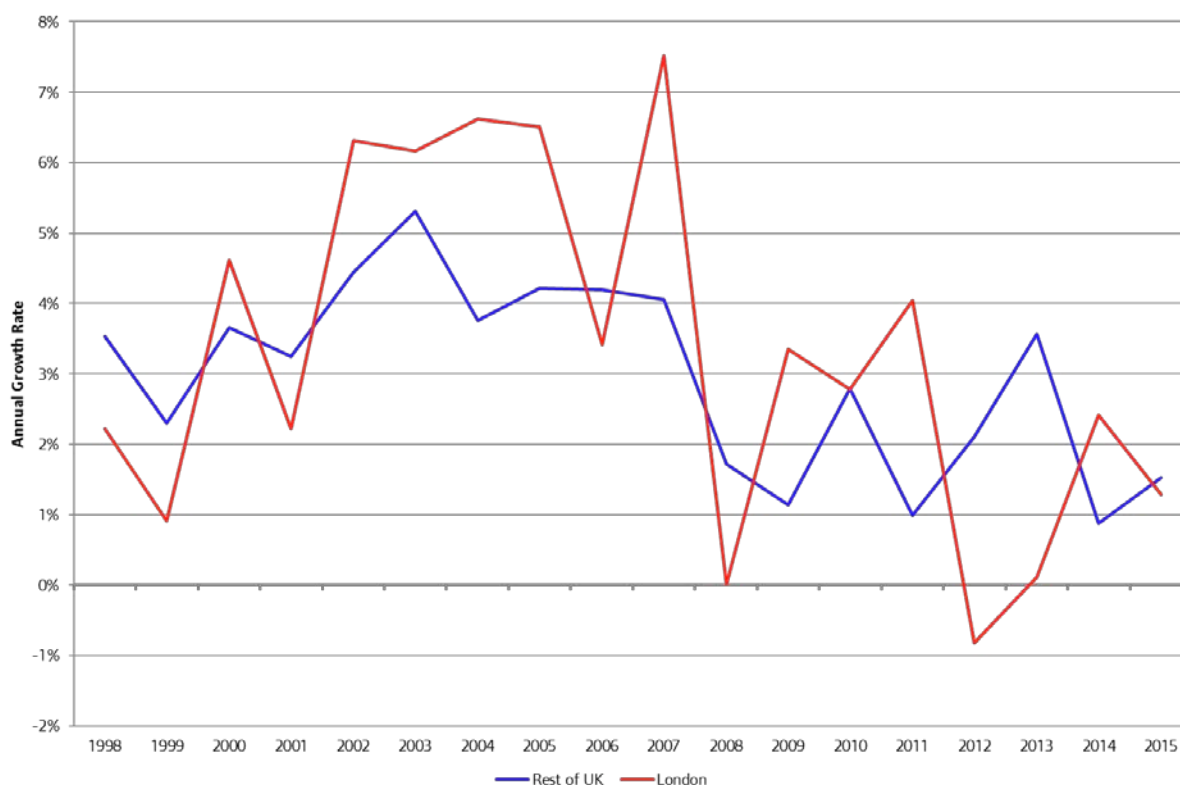
Figure 3.1: Nominal GVA per workforce job, London and rest of UK



Source: GLA Economics calculations

However during the time period, growth in GVA in nominal terms has slowed noticeably since 2008. Between 1997 and 2015, in nominal terms, the average annual growth rate of GVA per workforce job in London was 3.3 per cent compared to 3.0 per cent for the rest of the UK. However, since 2008, the growth rates were 1.9 per cent per annum for both London and the rest of the UK. Figure 3.2 shows the annual growth rate in nominal GVA per workforce job over the time series.

Figure 3.2: Annual growth rate of nominal GVA per workforce job, London and rest of UK

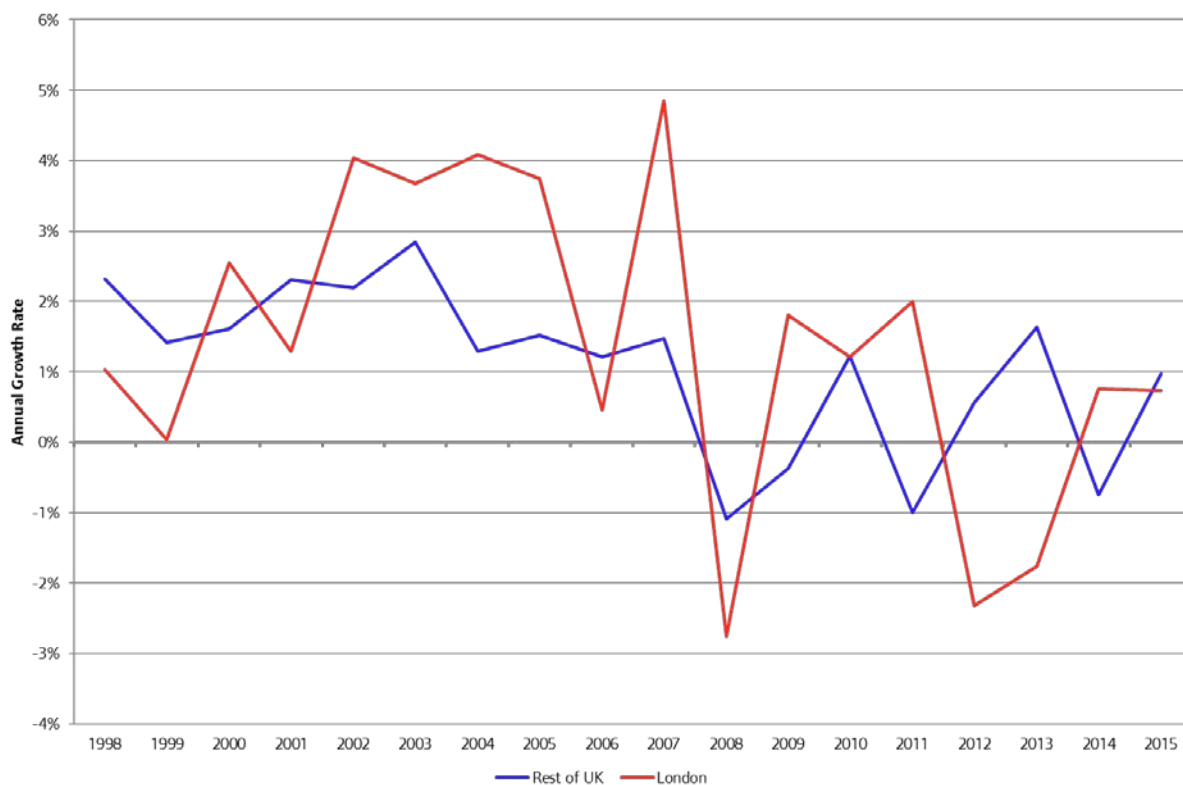


Source: GLA Economics calculations

Whilst it appears that productivity growth has been positive over the course of the time period, when accounting for changes in prices, the analysis is less positive, especially since the recession. Using GDP deflators from HM Treasury, Figure 3.3 provides the annual growth rate of GVA per workforce job in real terms². This finds that following the real terms fall in 2008, real GVA per workforce job in London only grew by 0.35 per cent per annum through to 2015, whereas in the rest of the UK, the growth rate was 0.32 per cent per annum.

² HM Treasury, "GDP deflators at market prices, and money GDP: December 2016 (Quarterly National Accounts)". Unless where stated, data has been converted into 2015 prices. Data on UK deflators has been used throughout, since regional price deflators are not publicly available.

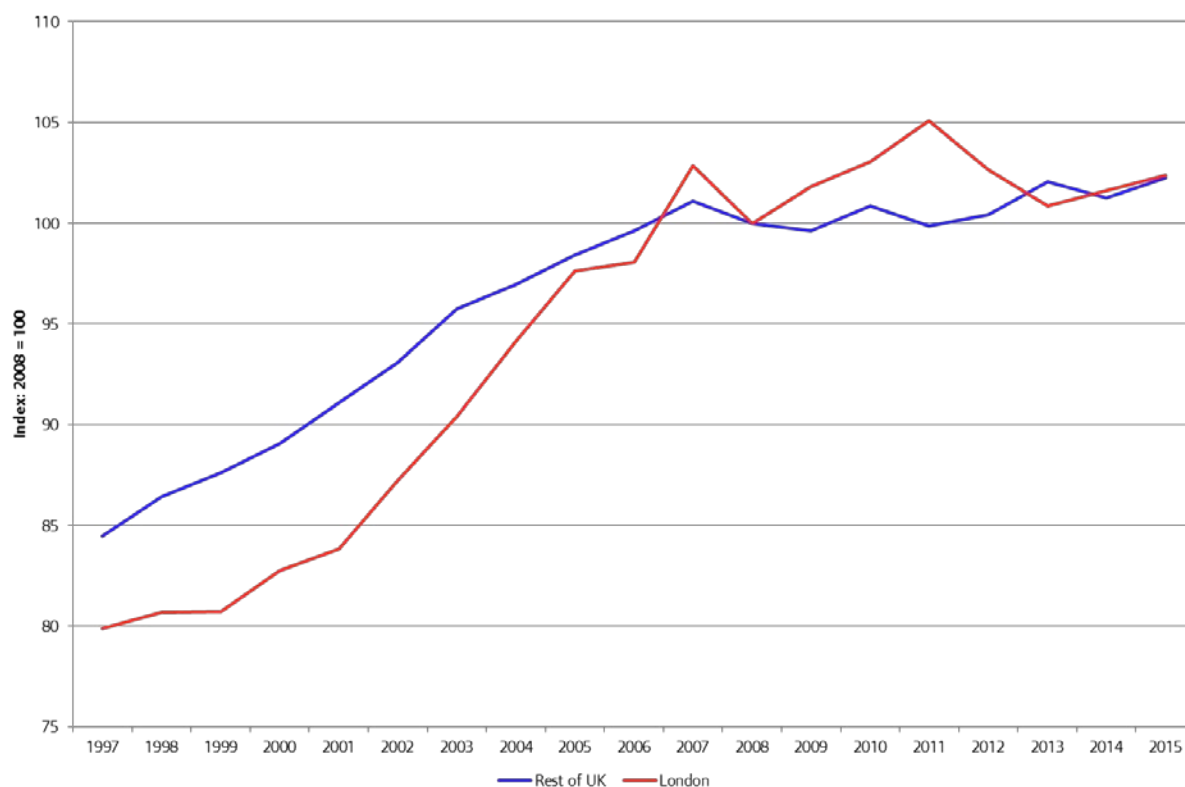
Figure 3.3: Annual growth rate in real terms GVA per workforce job, London and rest of UK



Source: GLA Economics calculations

Converting these into index values with a base year of 2008, Figure 3.4 shows clearly the strong growth in real terms GVA per workforce job in the first half of the time series, with limited change in levels of labour productivity in recent times.

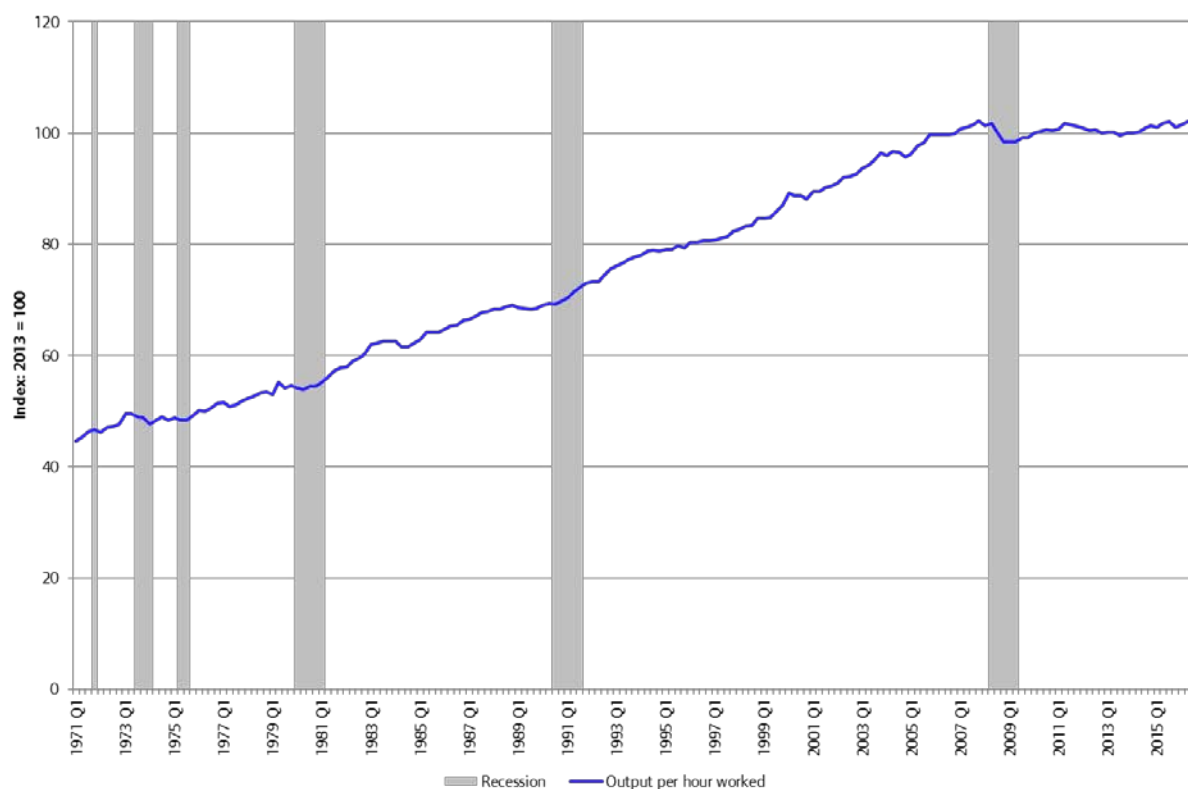
Figure 3.4: GVA per workforce job index, London and rest of UK



Source: GLA Economics calculations

Over a much longer run, productivity growth has been consistent, and the experience of the UK economy following this recession is different to that of previous downturns, which is shown in Figure 3.5 (which unlike the previous charts are relating to per hour productivity rather than per job productivity). Our analysis shows that the experience of the period following this recession is different to previous recessions – a subject which we look to evidence and provide potential reasons for within this chapter.

Figure 3.5: Output per hour worked, UK, 1971 Q1 – 2016 Q3



Source: *Labour Productivity, Q3 2016; Office for National Statistics. Grey bars indicate recession periods.*

Developing a long run history of output per job has been previously created by GLA Economics as part of our employment projections³. For London calculations, we developed a long run time series of GVA back to 1971, as well as using the London Jobs Series to create estimates of output per job back to 1971. Using available data for the UK as a whole allowed a constant price estimate of output per job to be developed, and this is shown in Figure 3.6. The data finds that levels of labour productivity were similar throughout much of the 1970s and 1980s. However since the end of the 1980s, there has been a divergence between London and the UK, which is explored in more detail in the following section.

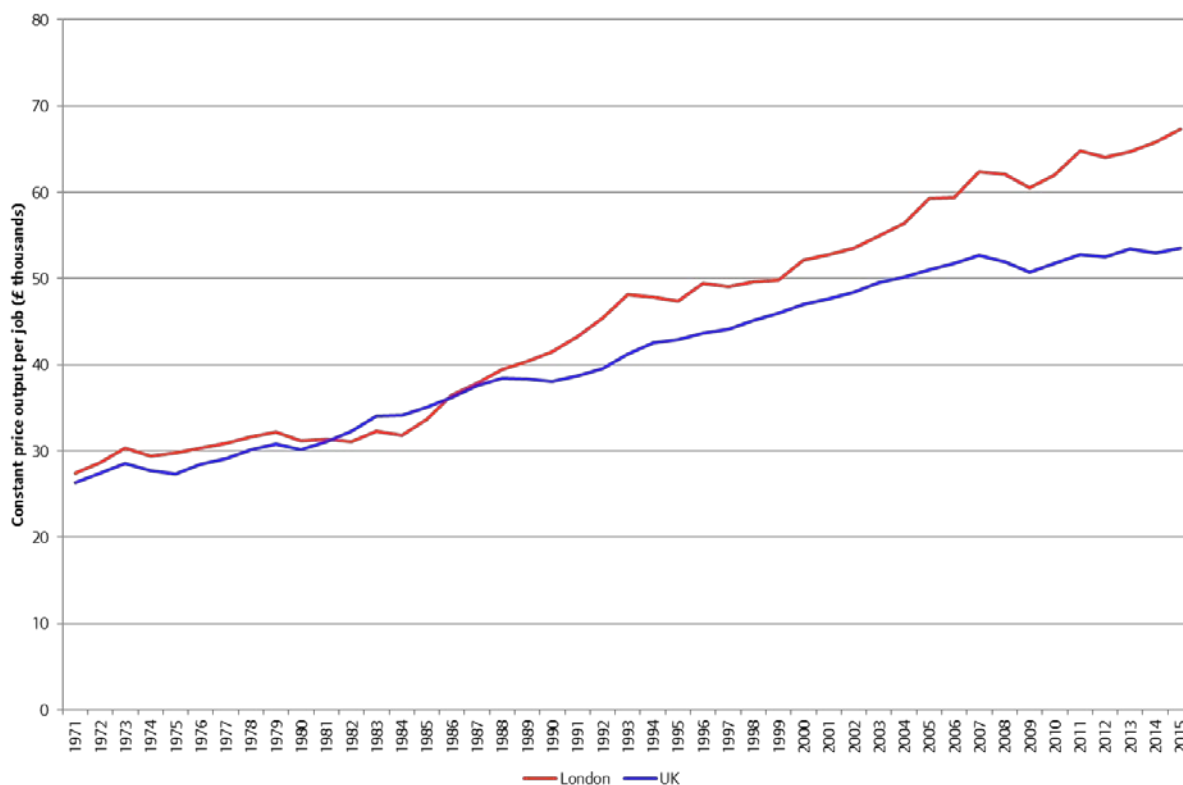
It should be noted however that the methodology used to create the estimates of output per job in Figure 3.6 are not entirely consistent with the methodology used in this paper; this research uses component data of GVA to develop attributions of published output to that of the workforce. In addition, it should be noted that the calculations in this paper do not utilise the London Jobs Series as the denominator in the GVA per workforce job calculation. This said, Figure 3.6 does provide some useful insight into the trends in productivity for both London and the UK, and do align with our understanding of London’s economy as outlined in Chapter 1 of the Economic Evidence Base for London⁴.

³ GLA Economics, London labour market projections 2016

⁴ GLA Economics, Economic Evidence Base for London 2016

The chart also highlights how the experience of the 2008/09 recession was different to previous downturns. The data for the UK shows how following 2008, growth rates in output per job were not at pre-trend level; for London, growth in output per job has been comparatively stronger.

Figure 3.6: Output per job trends for London and the UK, 1971 - 2015



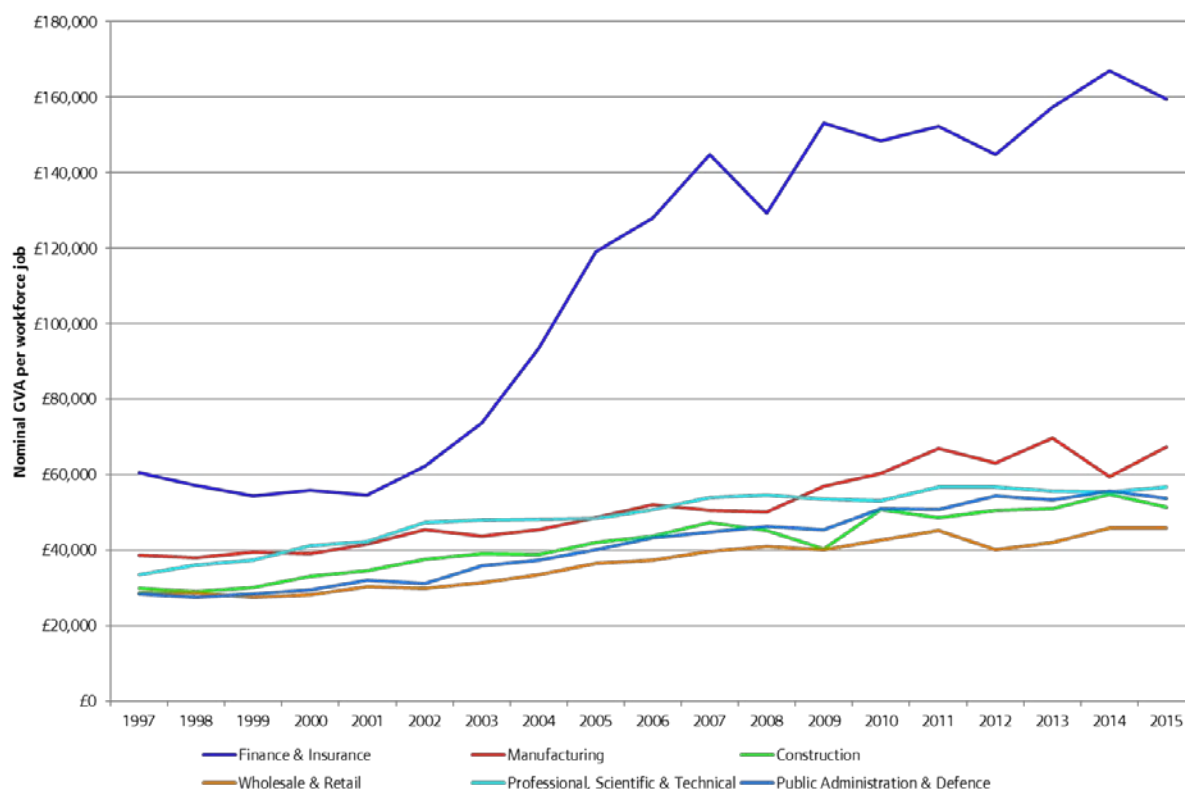
Source: ONS National Accounts, Regional GVA and Workforce Jobs figures, and GLA Economics estimates

3.1.1: Industry sector analysis

In nominal terms, it is clear that one industry in particular has seen exceptional productivity growth between 1997 and 2015, that being Financial and Insurance Activities, as is shown in Figure 3.7. Over the time period, nominal GVA per workforce job in this sector in London has increased by 164 per cent, much higher than the average for all sectors of 79 per cent. However it should be noted that a large part of that growth occurred between 2002 and 2007, with 2004 and 2005 witnessing annual growth in excess of 25 per cent.

For other major selected sectors (Manufacturing, Construction, Wholesale and Retail; Professional, Scientific and Technical activities; Public Administration and Defence), growth rates in nominal terms have been lower. Wholesale and Retail trade has seen 60 per cent growth since 1997; Professional, Scientific and Technical activities has grown by 70 per cent. Growth in Manufacturing and Construction have also been above average, at 75 per cent and 72 per cent respectively, however in the case of Construction, this masks significant volatility across the time series.

Figure 3.7: Nominal GVA per workforce job by 1 digit SIC section, London



Source: GLA Economics calculations

3.1.2: Productivity excluding the financial and insurance activities sector

The Financial & Insurance activities sector is the largest single sector of London's economy. It accounts for 16.3 per cent of London's economy, and the sector in London accounts for 51.2 per cent of the total for the UK. On top of this, excluding very small sectors such as Mining & Quarrying, and Activities of Households; the sector has a GVA per workforce significantly higher than London and the UK as a whole.

In London, the GVA per workforce job of the Financial & Insurance activities sector was £159,447 in 2015, 173 per cent higher than the London all sector average. For the UK as a whole, the sector is 135 per cent higher than the all sector average for the UK. It can therefore be argued that this one sector skews the overall picture of labour productivity in the capital, hence if it could be argued that if growth in the productivity of this one sector is strong, it can mask weaker productivity growth in other sectors. This section of the chapter explores whether removing this sector from the analysis leads to different conclusions on the state of productivity in London (and the UK).

Table 3.1 shows the difference that removing the sector has in our calculations, with the sector accounting for £61.7 billion of GVA and 373,250 workforce jobs. As such removing this one sector, taking into account the impact that attribution of published GVA to the workforce of the whole economy excluding this one sector would have, it is estimated that GVA per workforce job is over £7,000 lower, or 12.3 per cent, than the all sector average.

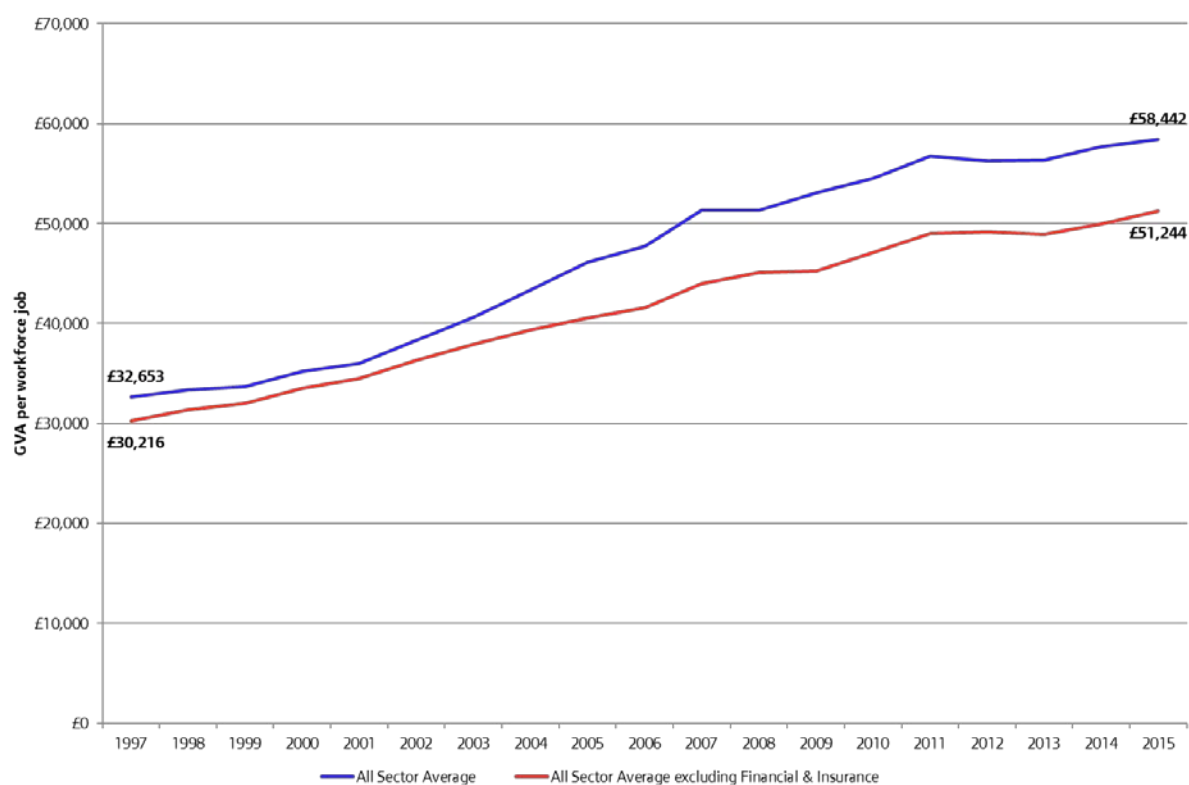
Table 3.1: Calculations of GVA per workforce job, with and without the Financial & Insurance activities sector

	London – All Sector Average	London – All Sectors excluding Financial & Insurance
Attributable GVA	£378.4 billion	£316.7 billion
Workforce Jobs	5,610,000	5,236,750
GVA per workforce job, 2015	£58,442	£51,244
Percentage Difference		-12.3%

Source: GLA Economics calculations

This is shown graphically in Figure 3.8. The growing importance of the sector in terms of its size and productivity in the early part of the 2000s is shown by the divergence of the two lines during that period. Since 2008, the two measures show no real difference in their trends.

Figure 3.8: GVA per workforce job, with and without the Financial & Insurance activities sector

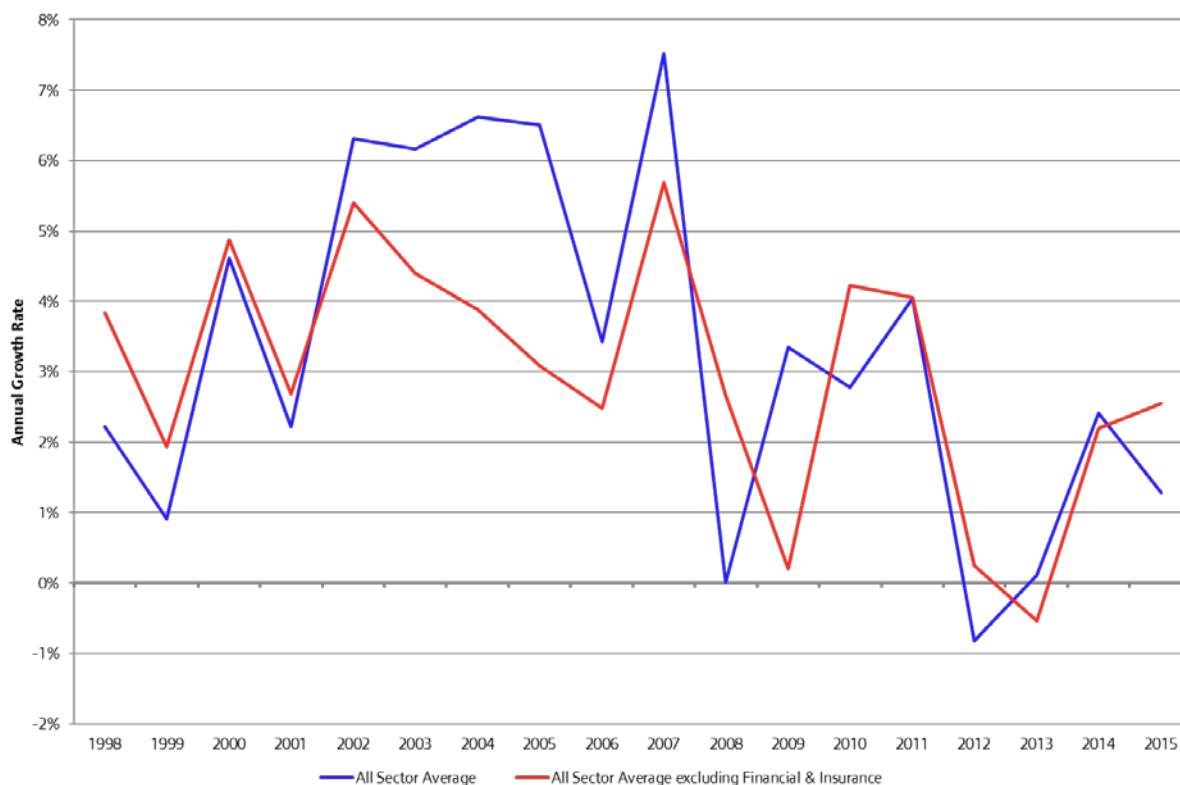


Source: GLA Economics calculations

Over the whole time series, the annual growth rates in GVA per workforce job, with and without the Finance and Insurance activities sector, have largely followed similar patterns. Notable exceptions are the period between 2002 and 2005 where there was a significant divergence; and in the 2007 – 2009 period, where growth in the all sector measure stalled in 2008, whereas for the measure which excludes the finance sector, growth stops one year later - implying the finance sector being the major driver of weak productivity growth in 2008. These findings are perhaps to be expected with the strong growth in the finance sector in the early 2000s and the

sector being the predominant cause in the downturn of the economy in 2008 and 2009. These data are shown in Figure 3.9.

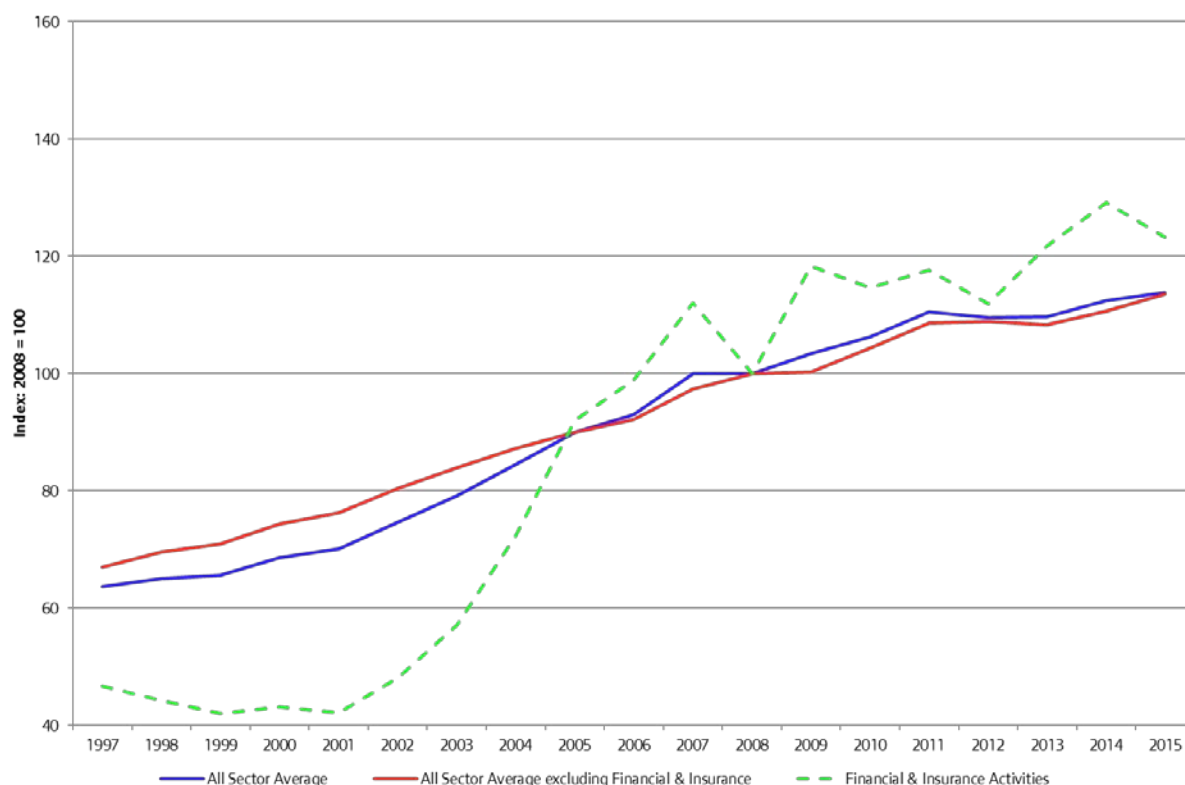
Figure 3.9: Annual growth rate of nominal GVA per workforce job, with and without the Financial & Insurance activities sector



Source: GLA Economics calculations

Looking at indexed figures of GVA per workforce job, it can be seen that productivity growth in the Financial & Insurance activities sector has been driving some of the growth in overall productivity growth in the economy as a whole. In nominal terms, productivity growth since 2008 has been slower than that of the preceding years.

Figure 3.10: Index of GVA per workforce job, with and without the Financial & Insurance activities sector; index 2008 = 100

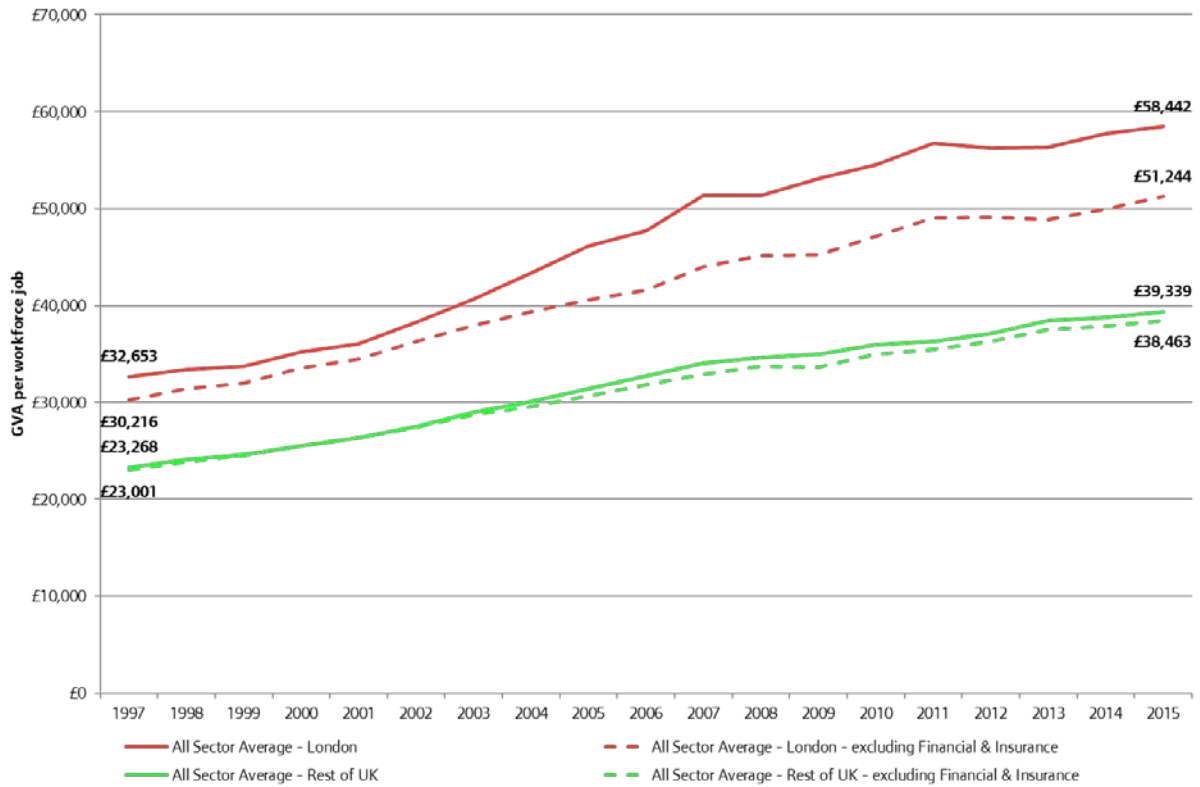


Source: GLA Economics calculations

As shown earlier the all sector average of GVA per workforce job in London is 48.6 per cent higher than the rest of the UK. However when the Financial and Insurance activities sector is removed, the difference between London (excl. finance) and the UK (excl. finance) drops to just 33.2 per cent.

Therefore in terms of labour productivity, the sector is comparatively less important in the rest of the UK than in London, with GVA per workforce job in the sector, in the rest of the UK only being 84 per cent higher than the all sector average, compared to 173 per cent higher for London. This therefore implies that removing the sector from the rest of the UK calculation would lead to less of a reduction in an all sector GVA per workforce job calculation than for London.

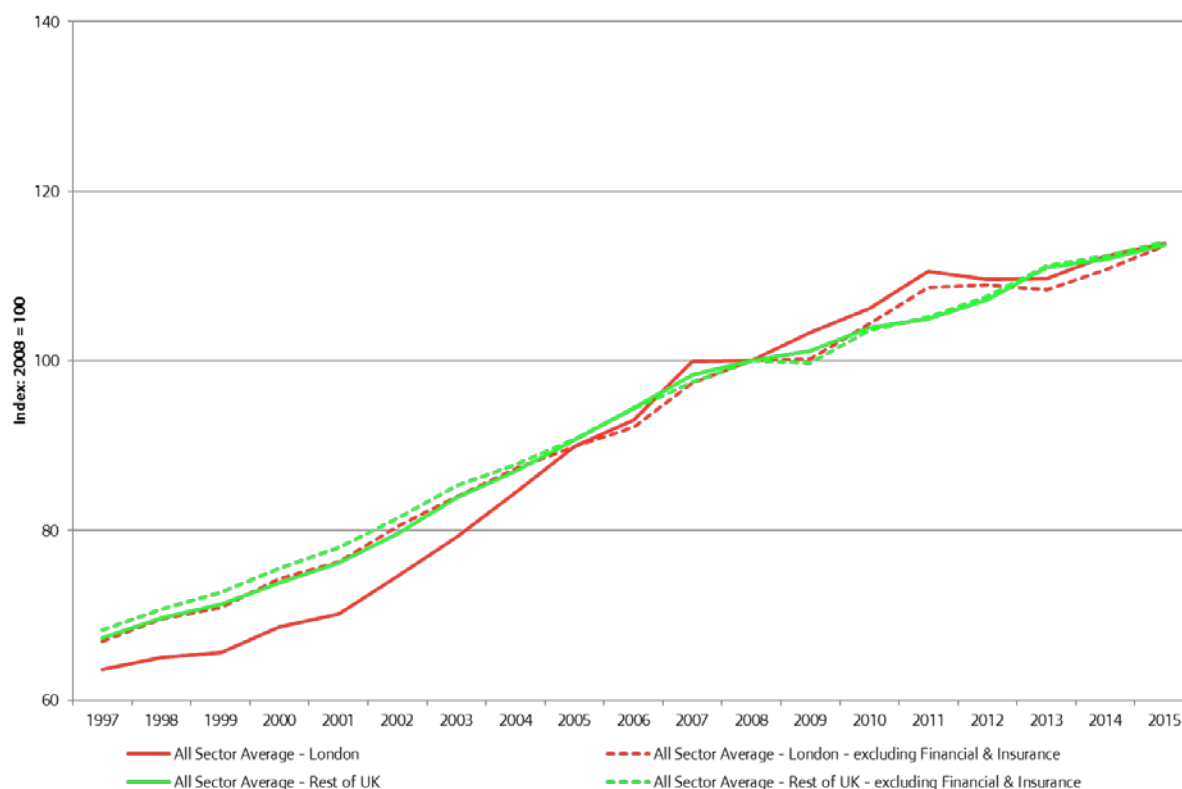
Figure 3.11: GVA per workforce job estimates, with and without the Financial & Insurance activities sector, London and the rest of UK



Source: GLA Economics calculations

Indexing all data to 2008 (as shown in Figure 3.12), results in similar conclusions to Figure 3.11, however with a major difference being in the 2010 – 2012 period, where nominal labour productivity growth was much weaker than in London, with an opposite trend being seen between 2012 and 2013. At the London level, trends in all sector average data are largely unaffected by the removal of the finance sector in the calculation; for the UK as a whole, these trends appear to hold.

Figure 3.12: Index of GVA per workforce job, with and without the Financial & Insurance activities sector, London and the rest of the UK; index 2008 = 100



Source: GLA Economics calculations

A clearer way of looking at the relative importance of the finance sector in driving increases in GVA per workforce job at the national level is to look at how London, the UK as a whole, and the rest of the UK has grown over time; including and excluding the Financial and Insurance activities sector, which has already been shown to drive changes in productivity for London.

The following table outlines how the all sector average GVA per workforce job has changed over the period 1997 – 2015:

Average GVA per workforce job, all sectors, 1997 – 2015

Area	1997	2008	2015
London	£32,653	£51,337	£58,442
United Kingdom	£25,084	£38,038	£42,918
UK minus London	£23,268	£34,595	£39,339

Compound annual growth rates – nominal terms

Area	1997 – 2015	2008 – 2015	1997 – 2008
London	3.29%	1.87%	4.20%
United Kingdom	3.03%	1.74%	3.86%
UK minus London	2.96%	1.85%	3.67%

The data on compound annual growth rates clearly shows that London has seen faster GVA per workforce job growth than the rest of the UK across the timeseries, averaging 3.3 per cent per annum in nominal terms, compared to 3.0 per cent for the rest of UK. From 2008 onwards, growth has been much lower, with nominal terms growth in London being 1.9 per cent per annum through to 2015.

When removing the Financial & Insurance activities sector from the analysis, similar conclusions are shown, compound annual growth rates of GVA per workforce job are higher for London compared to the rest of the UK.

Average GVA per workforce job, all sectors excluding Finance & Insurance, 1997 – 2015

Area	1997	2008	2015
London	£30,216	£45,128	£51,244
United Kingdom	£24,478	£36,312	£40,960
UK minus London	£23,001	£33,726	£38,463

Compound annual growth rates – nominal terms

Area	1997 – 2015	2008 – 2015	1997 – 2008
London	2.98%	1.83%	3.71%
United Kingdom	2.90%	1.74%	3.65%
UK minus London	2.90%	1.90%	3.54%

It is clear that the Financial & Insurance activities sector plays a role in explaining the higher labour productivity between London and the UK as a whole, however there is insufficient evidence that there is a significant difference in the trends of productivity growth with or without the sector.

3.1.3: Nominal vs real terms productivity

As outlined in Current Issues Note 50, real terms GVA data remains experimental and is not currently classified as a national statistic. However, over time, with real terms GVA data and deflators at a regional level, it will be possible to derive more refined estimates of real terms changes in productivity by sector⁵.

The focus of the modelling in this paper is on the income approach measure of calculating GVA, known as GVA (I). Given that GVA (I) is in nominal terms, the series would need to be deflated by changes in price in order to derive real estimates of GVA for London. Ideally, we would want to use regional price indices to calculate this, however there are currently no timely official regional price indices available. In the absence of such data the EU manual of Regional Accounts recommends the use of national prices applied at a detailed industry level to model regional differences in the composition of products⁶. Using this method, “the regional variation in products serves in place of actual regional price differences”.

The ONS deflates industry level aggregates to create estimates of real GVA using the production approach to GVA, known as GVA (P). Through this, it provides a set of implied aggregate level

⁵ [“Modelling real quarterly GVA data for London”](#), GLA Economics Current Issues Note 50, December 2016

⁶ [“Modelling real quarterly GVA data for London”](#), GLA Economics Current Issues Note 50, December 2016; pp. 6 – 7.

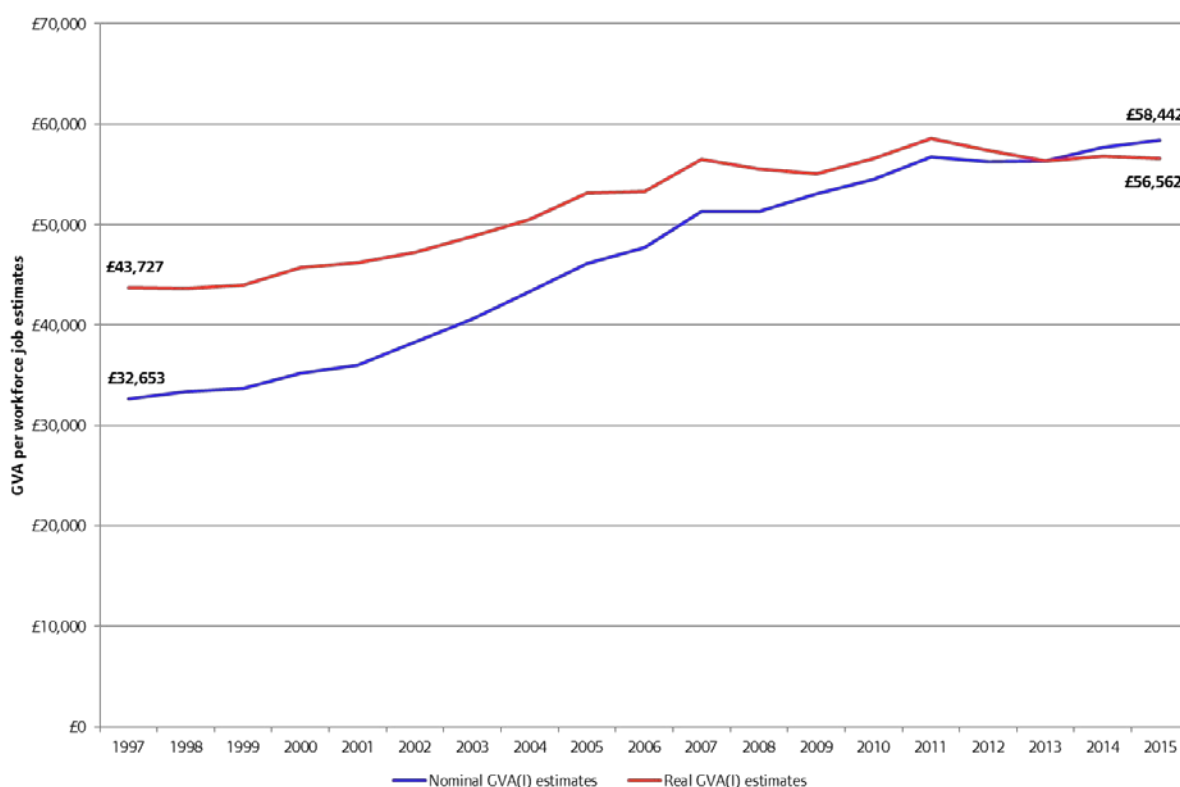
deflators for each industry within each region. For the analysis here, the implied deflators from GVA (P) have been used to adjust the GVA (I) data into a “real” terms series. As mentioned in Current Issues Note 50, GLA Economics are supportive of any future work the ONS will undertake to produce official, timely real estimates of economic activity in London.

An alternative approach would be to simply use GDP deflators, such as those provided by HM Treasury. This would mean that there would be one deflator value used consistently across all sectors. It is arguably a weaker approach and therefore has not been considered for this work. Given the fact that GVA (P) is currently not designated as a national statistic, the analysis which follows should be treated as indicative, but does provide insight into trends in labour productivity over recent times.

From the annual release on GVA using the production method, implied deflators by industry are available, however the data only is available from 1998 to 2014, therefore 1 year from each end of our analysis period is not available. To account for this, a linear trend in the implied deflators have been used to create the estimates for 1997 and 2015.

Figure 3.13 looks at the difference between our nominal and real estimates of GVA per workforce job, most notably showing that levels of per job productivity in London have not exceeded levels reached in 2011.

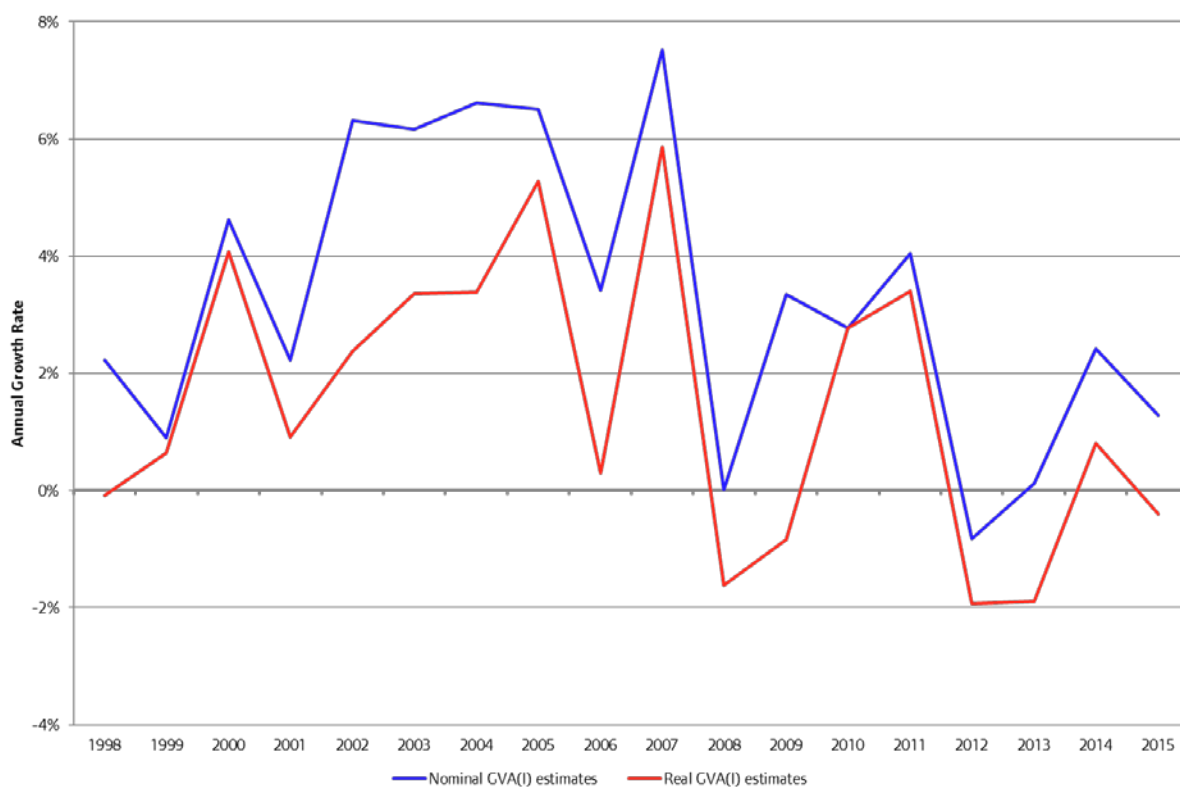
Figure 3.13: Nominal and real terms estimates of GVA per workforce job, London



Source: GLA Economics calculations

The recent relatively poor productivity performance is shown by Figure 3.14 on annual growth rates in GVA per workforce job. In both 2012 and 2013, falls of 1.9 per cent were seen, with only marginal growth in 2014 and a further fall in 2015.

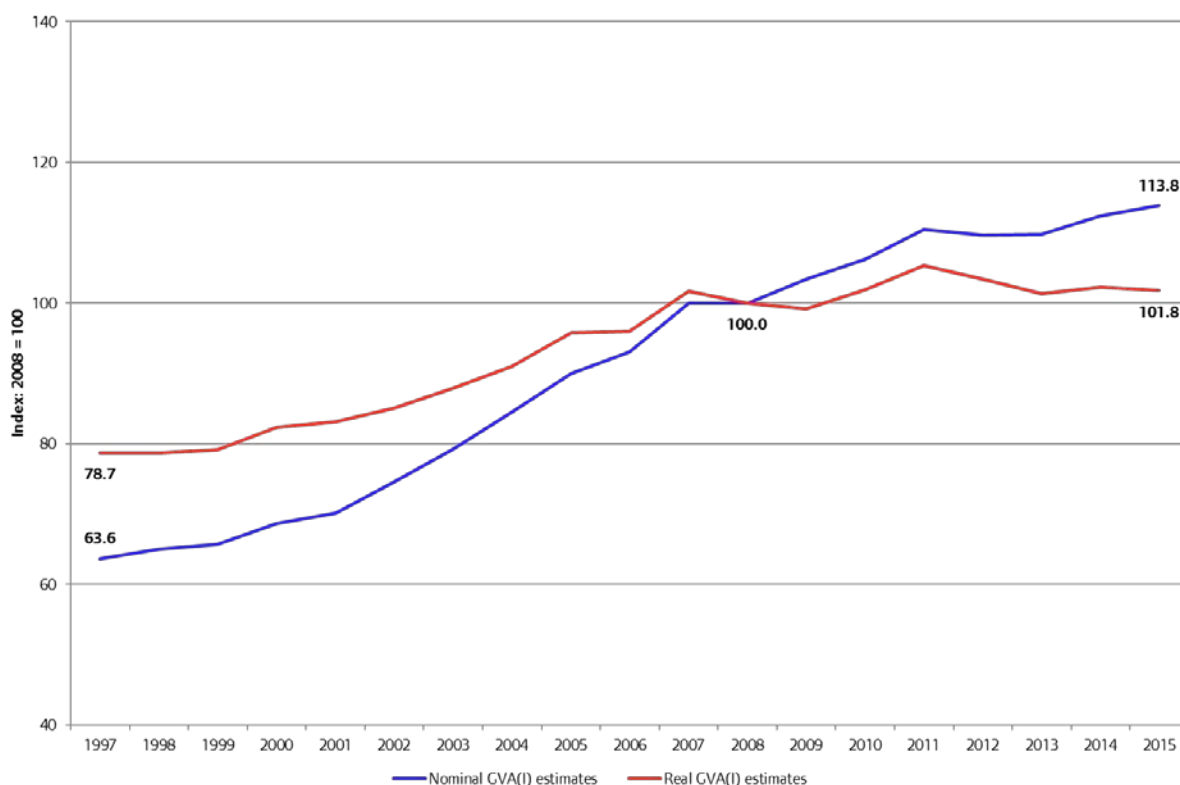
Figure 3.14: Annual growth rate in real terms GVA per workforce job, London



Source: GLA Economics calculations

Figure 3.15 shows the difference between the nominal and real estimates more clearly by indexing the data to 2008. The period around the recession saw labour productivity fall marginally before reasonably strong performance through to 2011, but then the data shows the fall from 2011 to 2015.

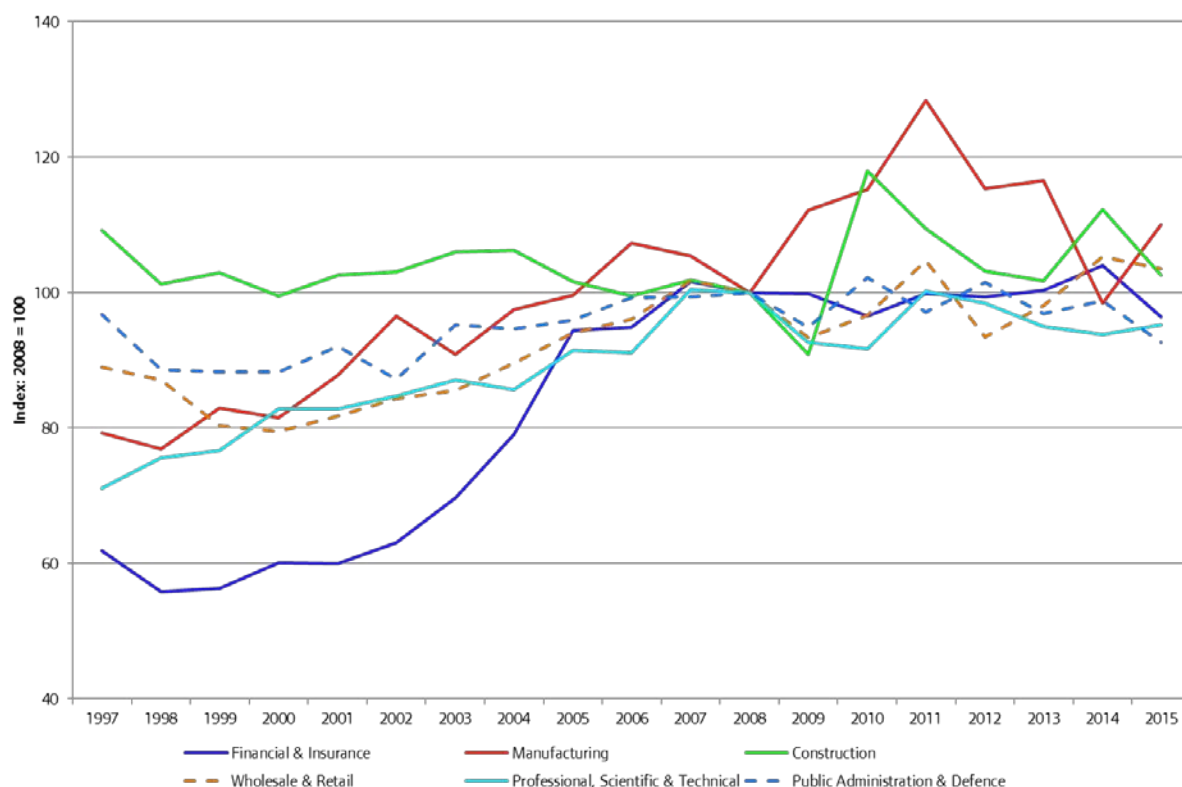
Figure 3.15: Real terms GVA per workforce job index, London; index 2008 = 100



Source: GLA Economics calculations

Breaking these results down to 1 digit SIC sector level provides insights into the overarching trends shown in the previous diagrams. Figure 3.16 shows a real terms index of GVA per workforce job for selected sectors. Most notably, the chart shows relatively poor productivity growth in sectors such as Professional, Scientific & Technical activities; Public Administration and Defence; and Financial & Insurance activities; all of which have had negative or limited productivity growth since 2008. Some sectors have bucked this trend, notably Manufacturing, and Construction, which have shown periods of higher productivity growth; the data however are quite volatile.

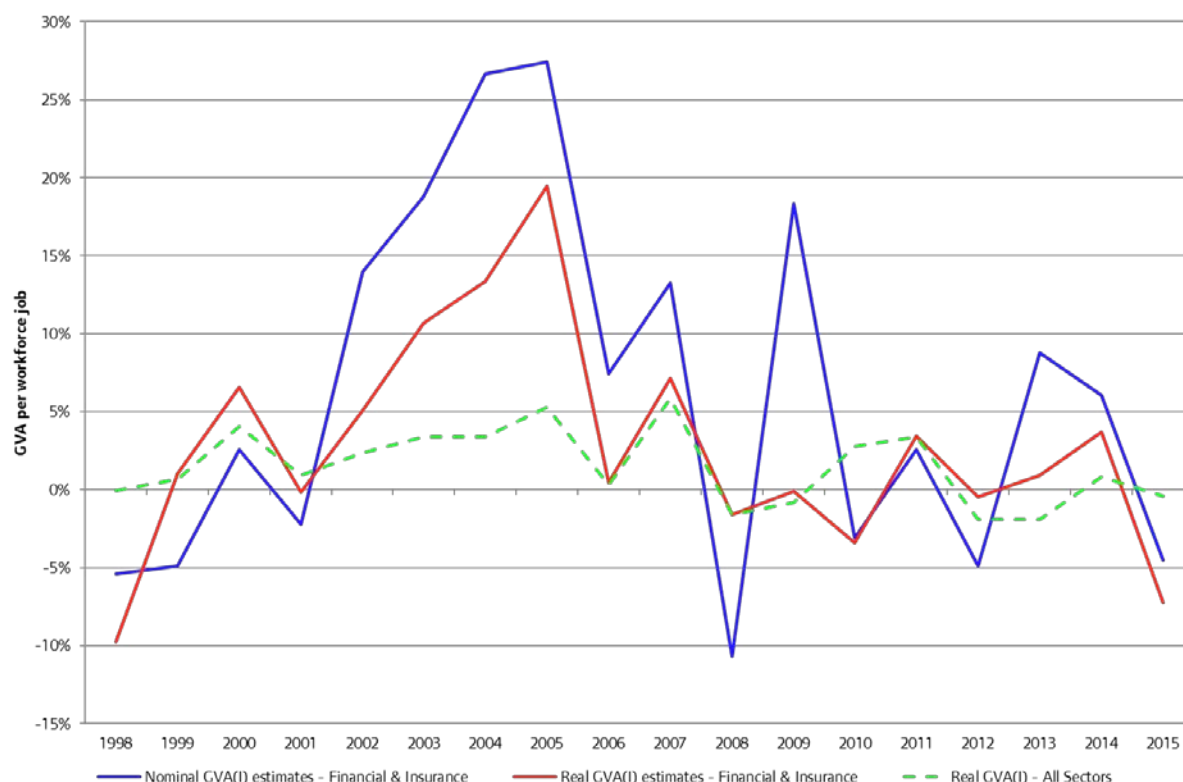
Figure 3.16: Real terms GVA per workforce job indices by sector; index 2008 = 100



Source: GLA Economics calculations

When focusing further on specific sectors of the economy, the volatility and trends in productivity growth can be seen more clearly. Figure 3.17 shows the trends for the Financial & Insurance Activities sector. It is clear that much of the overall productivity growth in the London economy through the early to mid-2000s could be explained by the very strong growth in the financial sector (with real terms productivity growth in excess of 10 per cent per annum between 2003 and 2005), but in recent times, productivity growth has fluctuated, with a significant fall in 2015 (however it should be mentioned that as there are not implied deflators available for 2015, the values for this year are an estimate).

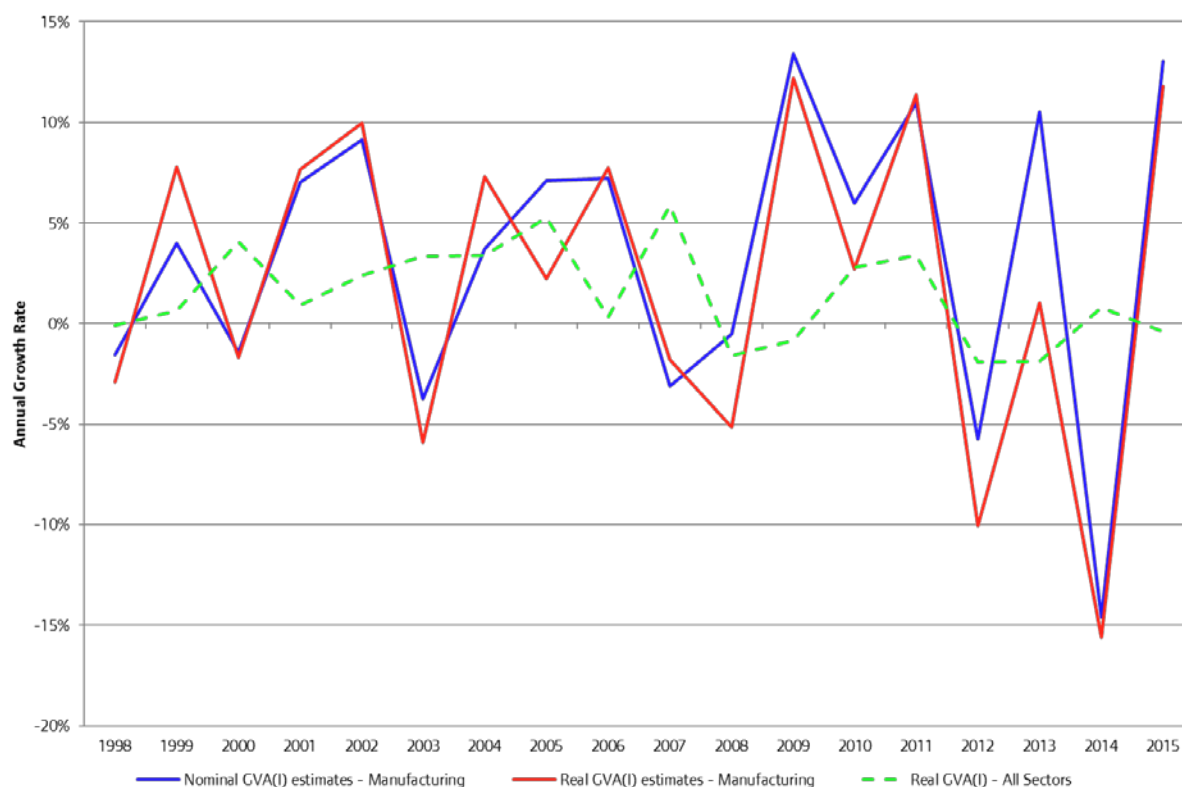
Figure 3.17: Nominal and real terms productivity growth, Financial & Insurance activities, London



Source: GLA Economics calculations

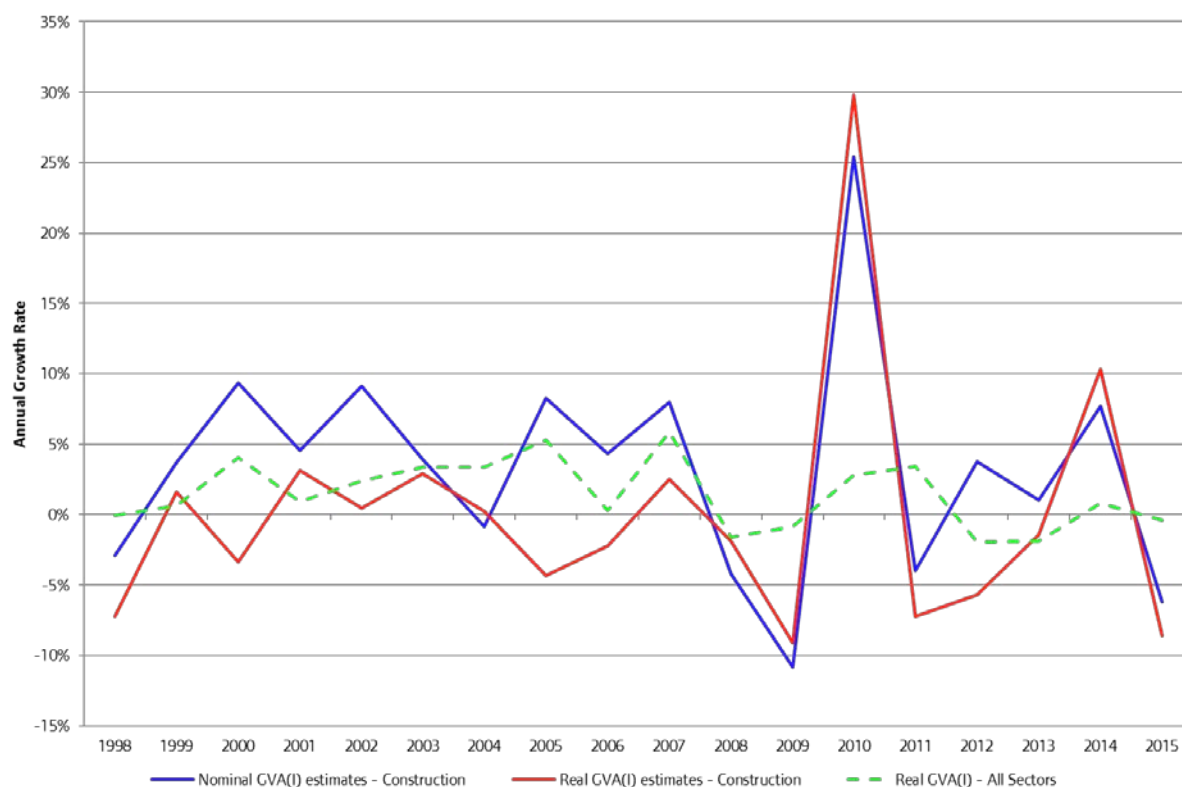
The volatility in estimates for the manufacturing sector are more stark, especially in the period following 2008. Taking the whole period in its entirety would suggest slight growth in productivity (as shown in Figure 3.18), but on an individual year basis, the volatility of estimates make it hard to draw conclusions from the data.

Figure 3.18: Nominal and real terms productivity growth, Manufacturing, London



The trends for the construction sector are generally flatter, as shown in Figure 3.19, however one significant outlier can be seen in 2010, with exceptionally large productivity growth in that one particular year (however this followed a year where labour productivity fell). Typically though, across the time series, real terms productivity growth in the construction sector has lagged behind the all sector average productivity growth.

Figure 3.19: Nominal and real terms productivity growth, Construction, London



Source: GLA Economics calculations

Further data on real terms estimates of GVA per workforce job, values and indices are available within Appendix F.

4. Conclusions

This paper has updated the methodology to calculate GVA per workforce job first established within Working Paper 63, taking advantage of more data on components of GVA being made publicly available from the Office for National Statistics. This has led to the creation of an identical model for all nations and regions of the UK for the calculation of GVA per workforce job at the 1 digit SIC section level. Different approaches for 2 digit SIC division level estimates remain for regions and the UK as a whole.

In nominal terms, for 2015, the all-sector average GVA per workforce job in London increased by 1.3 per cent on the previous year to £58,442; a value 36.1 per cent higher than the UK as a whole and 48.6 per cent higher than the UK excluding London. In real terms, GVA per workforce job in London fell by 0.4 per cent compared to the previous year; and in 2015, remains below the value seen in 2010.

This paper has looked into greater detail on the trends in productivity in recent times, across the economy and within individual sectors, and has undertaken a literature review which attempts to explain how the trends in productivity following the recession run contrary to previous experiences following downturns. There is clearly more analysis that can be made on the topic, which is likely to continue to stimulate debate into the future.

This paper has provided two case studies for where the GVA per workforce job methodology has been utilised to provide new insight into the economic impact of specific sectors of London's economy. Our analysis of tourism and the creative industries are updates of previous GLA Economics papers (Current Issues Note 44 and Working Paper 70 respectively). The methodology can be modified and applied to any sector with a definition bound by the Standard Industrial Classification, using the same principles outlined within these case studies.

Finally, we are grateful to the Office for National Statistics for the publication of further data on components of GVA within their Regional Gross Value Added (Income Approach) release. This has enabled us to refine our model to make it consistent for all regions.

Appendix A: Methodology

This chapter provides an overview of the methodology used to calculate estimates for each region and nation, and by industry section and division.

A.1 Gross Value Added defined

Gross Value Added measures the contribution to the economy of each individual producer, industry or sector. More simply put, it is the value added generated from activity in the economy. It is closely related to the concept of Gross Domestic Product (which is used most notably in reporting of national output), through the following definition:

Gross Value Added + (Taxes on Products) – (Subsidies on Products) = Gross Domestic Product

Regional Gross Value Added (GVA) is currently estimated using two approaches, either through an income or production approach. Traditionally regional accounts have been presented using the income approach; however experimental estimates of regional GVA using the production approach were published for the first time in December 2013, as referenced in GLA Economics' Current Issues Note 41.

This paper focuses on the headline figures of GVA using the income approach; the methodology to generate these estimates requires the component elements of GVA, which are as follows:

- Compensation of Employees (CoE)
- Gross operating surplus/mixed income (GOS/MI), which includes profits, non-market capital consumption and holding gains, self-employment and rental income.
- Taxes less subsidies on production

A.2 Updated methodology

For Working Paper 63, we used a mixture of publicly available and specifically requested statistics from the ONS to develop a methodology to attribute the proportion of published GVA to the workforce. The models however varied between those used for individual regions and the UK as a whole; with the former using a range of simplifying assumptions based on the availability of component data within GVA from the Regional Accounts.

For this update, the methodology for both the UK and regions in attributing the proportion of published GVA to the workforce is identical as more component level data have been published. This section therefore outlines the steps in the model used in attributing published GVA to the workforce, with the worked example being for London, with all values in £ million.

Step 1: Estimation of Gross Operating Surplus

As outlined in the previous section, GOS includes elements such as profits, non-market capital consumption and holding gains, and rental income. Within the Regional Gross Value Added (Income Approach) data publication this year, data on rental income, non-market capital consumption, holding gains, gross trading profits and gross trading surplus have been provided for all regions and 1 digit SIC sections. Therefore the estimation of GOS is as follows:

GOS = (Rental Income + Non Market Capital Consumption + Gross Trading Profits + Gross Trading Surplus) – Holding Gains

A	Rental income	49,988
B	Non-market capital consumption	4,797
C	Gross trading profits	98,768
D	Gross trading surplus	1,554
E	Holding gains	-1,274
Estimated Gross Operating Surplus		= (A + B + C + D) – E = 156,381

Step 2: Estimated taxes less subsidies

To derive an estimate of the taxes less subsidies component; data on total GVA, compensation of employees, self-employment income, and the estimate of GOS calculated in the previous step are used to estimate the residual, which is assumed to be the sum of taxes less subsidies. The calculation step are as follows:

Taxes less subsidies = (Total GVA – CoE) – (Self employment income – GOS)

A	Published GVA	378,424
B	Published CoE	200,605
C	Self-employment income	17,076
D	Estimated GOS	156,381
Estimated taxes less subsidies		= (A – B) – (C + D) = 4,362

Step 3: Estimation of GOS/MI

To calculate the total GOS/MI component of GVA, data on the estimated total GOS as well as self-employment income (also referred to as mixed income) are added together

A	Estimated GOS	156,381
B	Self-employment income (mixed income)	17,076
Estimated GOS/MI		= A + B = 173,457

Step 4: Estimation of GOS/MI excluding rentals

To calculate GOS/MI excluding rentals, published data on rental incomes are subtracted from the estimate of GOS/MI calculated in the previous step.

A	Estimated GOS/MI	173,457
B	Rental income	49,988
	Estimated GOS/MI excluding rentals	= A - B = 123,469

Step 5: Calculation of taxes less subsidies excluding rental incomes

Similarly to the method used in estimating GVA per workforce job in our previous publication, it is assumed that a proportion of rental incomes would be subsumed within taxes less subsidies. The following equation outlines how rental incomes have been removed from the estimate of taxes less subsidies:

$$\text{Taxes less subsidies (excl. rental incomes)} = \text{Taxes less subsidies} - [(\text{Rental Income}/\text{Total GVA}) * \text{Taxes less subsidies}]$$

A	Total rental income	49,988
B	Total GVA	378,424
C	Estimated taxes less subsidies	4,362
	Estimated taxes less subsidies (excluding rental income)	= C - [(A/B) * C] = 3,786

Step 6: Estimation of GVA attributable to the workforce

Using the calculation steps above, the final estimate of attributable GVA can be estimated, as follows:

$$\text{Attributable GVA} = \text{CoE} + (\text{Estimated GOS/MI excluding rentals}) + (\text{taxes less subsidies excluding rentals})$$

Or more simply put:

$$\text{Attributable GVA} = \text{CoE} + \text{Step 4} + \text{Step 5}$$

A	Total GVA	378,424
B	Compensation of employees	200,605
C	Estimated GOS/MI excluding rentals	123,469
D	Estimated taxes less subsidies (excluding rental income)	3,786
E	Attributable GVA	= B + C + D = 327,860
	Proportion of published GVA attributable to the workforce	= E / A = 86.6%

A.3 Summary of calculation: Estimates of section and division level GVA per workforce job

The main update to the methodology over Working Paper 63 is in the attribution model of published GVA to the workforce. The remainder of the methodology in the final calculation of

estimates at both the section and division level are unchanged and can be found within Chapter 3 of Working Paper 63. The following section provides a summary of the calculation steps for section and division level GVA per workforce GVA; for London and the UK.

A.3.1 Section level estimates

The denominator of the GVA per workforce job equation requires the use of the ONS Workforce Jobs series (employee jobs and self-employed jobs components). As the base year for the estimates provided in this paper is 2015, a four quarter average of published workforce jobs by section is calculated.

The GVA per workforce job for each section is calculated by:

$$\frac{(\text{Published Regional GVA} * \text{Proportion of GVA attributable to workforce})}{\text{Four Quarter workforce job average}}$$

The following table provides detail of the calculation step for Section M: Professional, Scientific and Technical Activities

A	Published GVA, Section M, London (£ million)	43,742
B	Proportion attributable to the workforce, Section M, London	99.5%
C	Attributable GVA (£ million)	= A * B = 43,520
D	Four quarter average workforce jobs, Section M, 2015, London	767,000
	GVA per workforce job, Section M, London	= C / D = £56,741

Source: Office for National Statistics, GLA Economics calculations

A.3.2 Division level estimates

The following tables outline how the estimates of GVA per workforce job in London for each division within a sector have been estimated; and is based on Section M: Professional, Scientific and Technical Activities. The first step is to transform the published figure for GVA in this sector and generating the attributable GVA to the activity of the workforce, therefore setting the constraint for the section level GVA.

Published GVA (£ million)	43,742
Proportion of GVA attributable to the workforce	99.5%
Total sector "attributable GVA" (£ million)	43,520

Source: Office for National Statistics, GLA Economics calculations

Data is then obtained on employees and self-employed (for the purposes of the model, the summation of the employees and self-employed is assumed to be the measure of workforce jobs). These data for this section is included below, with data on employees drawn from BRES and self-employed from APS. Using the equation as outlined in Step 2 within the relevant section of Chapter 3, the attributable GVA estimates for each division are estimated, ensuring that the summation of the division constrains to the whole sector GVA.

Example for Division 69: Legal and accounting activities⁷:

$$\left(\frac{179,700 + 42,000}{662,500 + 151,000} \right) * £43,520 \text{ million} = £11,871 \text{ million}$$

Division/Section	Employees	Self-employed	Attributable GVA (£ million)
69: Legal and accounting activities	179,700	42,000	11,871
70: Activities of head offices; management consultancy activities	253,900	33,000	15,348
71: Architectural and engineering activities; technical testing	87,500	19,000	5,698
72: Scientific research and development	18,200	-	974
73: Advertising and market research	78,200	17,000	5,093
74: Other professional, scientific and technical activities	40,700	40,000	4,317
75: Veterinary activities	4,100	-	219
M: Professional, scientific and technical activities	662,500	151,000	43,520

Source: Business Register and Employment Survey (employees), Annual Population Survey (self-employed); Office for National Statistics; GLA Economics calculations. '-' denotes zero self-employed jobs.

Data from ASHE is then obtained for each division and for the section as a whole; with these data and the attributable GVA, a proportion of adjusted section GVA is generated for each of the divisions; this method ensures that the summation of the adjusted GVA for each division constrains to the attributable GVA for the section, at the same time as enabling an adjustment for the relative wages in each of the divisions.

Example for Division 69: Legal and accounting activities

$$\frac{11,871 * 27.73}{(11,871 * 27.73) + (15,348 * 27.50) + \dots + (219 * 18.17)} = 29.9\%$$

$$29.9\% * £43,520 \text{ million} = £13,034 \text{ million}$$

⁷ Note for the purposes of this example, suppression and rounding of BRES and APS figures have been applied before calculations are made.

Division/Section	Attributable GVA (£ million)	Gross mean hourly wage, all employee jobs (£, London)	Proportion of section level GVA adjusted for relative wage (%)	Productivity adjusted GVA (£ million)
69: Legal and accounting activities	11,871	27.73	29.9	13,034
70: Activities of head offices; management consultancy activities	15,348	27.50	38.4	16,713
71: Architectural and engineering activities; technical testing	5,698	21.97	11.4	4,956
72: Scientific research and development	974	25.94	2.3	1,000
73: Advertising and market research	5,093	21.85	10.1	4,406
74: Other professional, scientific and technical activities	4,317	19.03	7.5	3,253
75: Veterinary activities	219	18.17	0.4	158
M: Professional, scientific and technical activities	43,520		100.0	43,520

Source: Annual Survey of Hours and Earnings, Office for National Statistics; GLA Economics calculations

Data from BRES and APS on employee jobs and self-employed is then used to model the proportion of total sector workforce jobs that will be assigned to each of the divisions within the section, ensuring that the sum of the divisions is constrained to the published workforce jobs for the section. The reason for this step is that BRES is a business survey therefore not accounting for the totality of the workforce, and APS is a household survey which has been used to estimate the number of self-employed in the division, therefore the summation of the employee and self-employed estimate will not equate to the published workforce job figure – this step models the published section workforce jobs into each of the division components.

Example for Division 69: Legal and accounting activities

$$\left(\frac{179,900 + 42,000}{662,500 + 151,000} \right) * 767,000 = 209,216$$

Division/Section	Employees	Self-employed	Modelled Workforce Jobs (based on four quarter average, 2014)
69: Legal and accounting activities	179,900	42,000	209,216
70: Activities of head offices; management consultancy activities	253,900	33,000	270,501
71: Architectural and engineering activities; technical testing	87,500	19,000	100,412
72: Scientific research and development	18,200	-	17,160
73: Advertising and market research	78,200	17,000	89,758
74: Other professional, scientific and technical activities	40,700	40,000	76,087
75: Veterinary activities	4,100	-	3,866
M: Professional, scientific and technical activities	662,500	151,000	767,000

Source: Office for National Statistics, GLA Economics calculations. '-' denotes zero self-employed jobs.

With these data on “productivity adjusted GVA” and modelled workforce jobs by division, the final calculation of GVA per workforce job can be made, and the results for the Professional, Scientific and Technical activities section is provided below.

Division/Section	Productivity adjusted GVA (£ million)	Modelled workforce jobs	GVA per workforce job estimate (£)
69: Legal and accounting activities	13,034	209,216	62,301
70: Activities of head offices; management consultancy activities	16,713	270,501	61,784
71: Architectural and engineering activities; technical testing	4,956	100,412	49,360
72: Scientific research and development	1,000	17,160	58,279
73: Advertising and market research	4,406	89,758	49,090
74: Other professional, scientific and technical activities	3,253	76,087	42,754
75: Veterinary activities	158	3,866	40,822
M: Professional, scientific and technical activities	43,520	767,000	56,741

Source: Office for National Statistics, GLA Economics calculations

A.3.3 Division level calculation, UK

Worked example of calculation for Division 64: Finance service activities except insurance and pension funding:

Published GVA, Division 64, UK ⁸ (£ million)	63,397
Proportion of GVA attributable to the workforce, Section K	93.0%
Attributable GVA (£ million)	58,941
Four quarter workforce job estimate (employed + self-employed)	530,250
GVA per workforce job estimate	£111,157

Source: Office for National Statistics, GLA Economics calculations

A.5 Attributions of total GVA to the workforce, London, 2015

	Sector Description	Published GVA, (£ million)	Proportion of GVA attributable to the workforce (%)	Attributable GVA (£ million)
A	Agriculture, Forestry and Fishing	62	97.8%	61
B	Mining and Quarrying	202	93.6%	189
C	Manufacturing	8,398	97.6%	8,195
D	Electricity, Gas, Steam and Air Conditioning Supply	3,082	98.3%	3,030
E	Water Supply, Sewerage, Waste Management	1,445	98.5%	1,423
F	Construction	16,020	92.6%	14,828
G	Wholesale and Retail Trade, Repair of Motor Vehicles	31,310	98.4%	30,797
H	Transportation and Storage	17,872	99.3%	17,749

⁸ GVA(O) as per Quarterly National Accounts – GDP low level aggregates

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I	Accommodation and Food Service	11,398	98.9%	11,270
J	Information and Communication	41,110	99.4%	40,851
K	Financial and Insurance Activities	61,703	96.5%	59,514
L	Real Estate	53,604	17.8%	9,548
M	Professional, Scientific and Technical Activities	43,742	99.5%	43,520
N	Administrative and Support Services	21,879	98.6%	21,581
O	Public Administration and Defence	12,021	100.0%	12,021
P	Education	17,715	99.7%	17,657
Q	Human Health and Social Work	20,859	99.6%	20,786
R	Arts, Entertainment and Recreation	6,846	99.5%	6,813
S	Other Service Activities	7,116	99.6%	7,085
T	Activities of households	2,041	100.0%	2,041
A-T	Overall	378,424	86.6%	327,860

A.6 Attributions of total GVA to the workforce, UK, 2015

	Sector Description	Published GVA, (£ million)	Proportion of GVA attributable to the workforce (%)	Attributable GVA (£ million)
A	Agriculture, Forestry and Fishing	10,833	93.3%	10,112
B	Mining and Quarrying	16,947	99.7%	16,904
C	Manufacturing	162,829	99.6%	162,129
D	Electricity, Gas, Steam and Air Conditioning Supply	24,824	99.2%	24,632
E	Water Supply, Sewerage, Waste Management	16,708	99.5%	16,631
F	Construction	101,937	95.2%	97,026
G	Wholesale and Retail Trade, Repair of Motor Vehicles	182,510	98.9%	180,587
H	Transportation and Storage	77,103	99.4%	76,635
I	Accommodation and Food Service	49,674	99.0%	49,189
J	Information and Communication	108,474	99.1%	107,477
K	Financial and Insurance Activities	120,351	93.0%	111,892
L	Real Estate	216,115	12.8%	27,597
M	Professional, Scientific and Technical Activities	124,730	99.3%	123,867
N	Administrative and Support Services	80,398	98.6%	79,247
O	Public Administration and Defence	78,548	100.0%	78,548
P	Education	98,025	99.8%	97,803
Q	Human Health and Social Work	130,723	99.8%	130,442
R	Arts, Entertainment and Recreation	22,983	99.5%	22,858
S	Other Service Activities	35,585	99.7%	35,463
T	Activities of households	7,045	100.0%	7,045
A-T	Overall	1,666,342	87.5%	1,457,503

Appendix B: Case studies of application of GVA per workforce job methodology

This appendix provides practical case studies where the GVA per workforce job methodology has been used (and modified) to derive estimates for bespoke sectors. Two examples, both updated from previous works, are provided here; for the tourism industry and creative industries.

Appendix B-1: Tourism

The estimates of GVA per workforce job in the tourism industry report is derived based upon the definition of tourism based upon work undertaken by the ONS and apportionments of employment directly to tourism from the Department of Culture, Media and Sport (DCMS). This ensures that analysis will be consistent with previous analysis of GLA Economics (specifically Working Paper 53 and Current Issues Note 44). The definition of tourism used in the analysis which follows is presented in the box below:

Box B.1: Definition of tourism used within this paper

- Division 55: Accommodation
- Division 56: Food and beverage service activities
- The whole of Section H: Transportation and Storage, except division 53: Postal and courier services
- Group 79.1, and 6 per cent of group 79.9; which forms most of division 79: Travel agency, tour operator and other reservation service and related activities
- Group 91.0, 95 per cent of group 92.0, and 80 per cent of group 93.1; which broadly fits the description of "Recreation"
- All other industries, except those listed above, including the remaining percentages of the split groups, but not including records where the industry is not known

Table B.1 sets out the apportionments of employee and self-employed jobs within these categories that would be directly related to tourism as outlined by DCMS, and is used towards the modelling of the employment supported by tourism in London. DCMS apportionment factors recognise that (in most sectors) not all employment will be generated by tourism. For example, within bars and restaurants, tourism helps to support employment through their demand for food and drink; however employment will also be supported through, for example, by office workers and residents. Therefore tourism can only be said to support a proportion of jobs in a sector and is outlined in the table below⁹.

⁹ The apportionments used by DCMS are referenced within GLA Economics Working Paper 53; page 6, footnote 2. The origins of these apportionments (and definition) are based from the UK Tourism Satellite Account "First Steps" project conducted in 2004. These factors are used in the absence of any London specific ratios.

Table B.1: DCMS apportionments of total employment to tourism

Element	Employees	Self-employed
Accommodation	56.4%	52.8%
Food and beverage service activities	41.1%	38.0%
Recreation	12.7%	39.7%
Transportation and storage (excluding postal and courier activities)	19.2%	9.1%
Travel agency and tour operator activities	100.0%	92.3%
All other industries	0.8%	0.8%

Source: Office for National Statistics; Department for Culture, Media and Sport

Within the definition of tourism in London as outlined in Box 1.1, there are a number of divisions which are used towards the calculation of GVA per workforce job, specifically:

- Section H: Transportation and Storage, less division 53 (Postal and courier services)
- Division 55: Accommodation
- Division 56: Food and beverage services
- Division 79: Travel agency, tour operator and other reservation service and related activities
- Division 91: Libraries, archives, museums and other cultural activities
- Division 92: Gambling and betting activities
- Division 93: Sports activities and amusement and recreation services
- All other industries; assumed to be total attributable GVA for London less the divisions outlined above

The following table outlines the productivity adjusted GVA and modelled workforce jobs for each of the divisions listed above (with the exception of “all other industries”, which will be estimated later):

Industry Group	Productivity adjusted GVA (£ million)	Modelled workforce jobs
55: Accommodation	2,197	63,740
56: Food and beverage service activities	9,074	313,510
Section H (Transportation and storage), less Division 53 [ie, the sum of Divisions 49 – 52)	16,116	248,644
79: Travel agency, tour operator and other reservation service activities	1,712	30,447
91: Libraries, archives, museums and other cultural activities	618	19,116
92: Gambling and betting activities	453	20,956
93: Sports activities and amusement and recreation activities	2,255	76,363

Source: GLA Economics calculations

Using this definition of tourism requires the estimates of division level GVA and modelled workforce jobs to be further broken down. The model here has not attempted to estimate group level GVA within its component division, as this would require self-employment data by 3 digit SIC07 groups, and wage data from ASHE (however the latter is potentially feasible since ASHE data is, where available, broken down to 4 digit SIC07 classes). The model used in this paper makes an assumption that productivity, and self-employment is split equally within groups, based upon the proportion of employees within each of groups (as provided by BRES). More

simply put, division level GVA and workforce jobs are apportioned out to 3 digit SIC07 groups based on the proportion of employees working in each group. The following table outlines the calculation of the group level GVA and workforce jobs based upon BRES data:

Number of employees within divisions and groups

The following table outlines the number of employees working in the divisions which form part of the definition of tourism. The second table then outlines the breakdown of employee jobs in specific groups within divisions.

Industry Division	Number of employees
79: Travel agency, tour operator and other reservation service	25,900
91: Libraries, archives, museums and other cultural activities	18,700
92: Gambling and betting activities	20,500
93: Sports activities and amusement and recreation activities	56,700

Source: Business Register and Employment Survey, Office for National Statistics

Industry Group	Number of employees	Share of related division
79.1: Travel agency and tour operator activities	23,600	91.1%
79.9: Other reservation service and related activities	2,300	8.8%
91.0: Libraries, archives, museums and other cultural activities	18,700	100.0%
92.0: Gambling and betting activities	20,500	100.0%
93.1: Sports activities	47,200	83.2%
93.2: Amusement and recreation activities	9,500	16.8%

Source: Business Register and Employment Survey, Office for National Statistics

The definition of tourism used in this report include groups where only a proportion of employment is assumed to be contained within the tourism industry (this is before the adjustment is made to account for the proportion of those jobs which are directly related to tourism, as given by the DCMS apportionment factors). The groups where this is the case are:

- Group 79.1: 100 per cent of employment
- Group 79.9: 6 per cent of employment
- Group 92.0: 95 per cent of employment
- Group 93.1: 80 per cent of employment

In Division 92, there is only one group within the division, therefore no further calculation is required, 95 per cent of the employment will be used as the factor to apportion out division level GVA and workforce jobs. However for Divisions 79 and 93, further calculations are made as follows:

For Division 79:

Group	Employees	Proportion of Group within tourism definition	Estimated employees within tourism definition
79.1: Travel agency and tour operator activities	23,600	100.0%	23,600
79.9: Other reservation service and related activities	2,300	6.0%	138
Division 79	25,900	--	23,738

A	Estimated employees contained within the tourism definition, Division 79	23,738
B	Total employees, Division 79	25,900
	Proportion of Division 79 contained within the tourism definition	= A / B = 23,738 / 25,900 = 91.7%

Source: Business Register and Employment Survey, Office for National Statistics; GLA Economics calculations

For Division 93:

Group	Employees	Proportion of Group within tourism definition	Estimated employees within tourism definition
93.1: Sports activities	47,200	80.0%	37,760
93.2: Amusement and recreation activities	9,500	0%	0
Division 93	56,700	--	37,760

A	Estimated employees contained within the tourism definition, Division 93	37,760
B	Total employees, Division 93	56,700
	Proportion of Division 93 contained within the tourism definition	= A / B = 37,760 / 56,700 = 66.6%

Source: Business Register and Employment Survey, Office for National Statistics; GLA Economics calculations

Apportionment of employment directly related to the tourism industry

The final adjustment is then made to account for the proportion of employees in each division that would be directly employed as a result of tourism through the use of the DCMS apportionment factors outlined in Chapter 1. For simplicity, only the apportionments for employees have been included in the model. Therefore the calculations for the proportion of modelled division level GVA and workforce jobs for each division within the definition of tourism used are as follows:

Division	BRES proportion of division level employees contained within the tourism definition	DCMS apportionment factor	Proportion of division level GVA and workforce jobs to be modelled to tourism (Column 2 multiplied by Column 3)
Section H, less Division 53	100.0%	0.192	19.2%
Division 55	100.0%	0.564	56.4%
Division 56	100.0%	0.411	41.1%
Division 79 (Groups 79.1 and 79.9)	91.7%	1.000	91.7%
Division 91 (Group 91.0)	100.0%	0.127	12.7%
Division 92 (Group 92.0)	95.0%	0.127	12.1%
Division 93 (Group 93.1)	66.6%	0.127	8.5%
All other industries	100.0%	0.008	0.8%

Source: Business Register and Employment Survey; Department of Culture, Media and Sport; and GLA Economics calculations

The table below provides the final calculation of GVA and workforce jobs for divisions within the tourism industry, with the exception of “all other industries” which is subsequently calculated:

Division	Productivity Adjusted GVA (£ million)	Division level workforce jobs	Proportion of division to be modelled to tourism	Tourism industry GVA in London (£ million)	Tourism industry workforce jobs
Section H, less Division 53	16,116	248,644	19.2%	3,094	47,740
Division 55	2,197	63,740	56.4%	1,239	35,949
Division 56	9,074	313,510	41.1%	3,729	128,853
Division 79	1,712	30,447	91.7%	1,569	27,906
Division 91	618	19,116	12.7%	78	2,428
Division 92	453	20,956	12.1%	55	2,528
Division 93	2,255	76,363	8.5%	191	6,459
Sum of these divisions	32,426	772,777			

Source: GLA Economics calculations

With these estimates, the “All other industries” component of the tourism definition can be calculated:

	Productivity Adjusted GVA (£ million)	Division level workforce jobs
Sum of divisions related to tourism	32,426	772,777
Total for all divisions, London (Sections A – T)	327,860	5,610,000
“All Other Industries”	295,434	4,837,223

Source: GLA Economics calculations

The “all other industries” category can then be added and a final estimate of tourism industry GVA and workforce jobs can be calculated, used towards the estimation of GVA per workforce job in the tourism industry, as shown in the table below:

Division	Productivity Adjusted GVA (£ million)	Division level WFJ	Proportion of division to be modelled to tourism	Tourism industry GVA in London (£ million)	Tourism industry workforce jobs
Section H, less Division 53	16,116	248,644	19.2%	3,094	47,740
Division 55	2,197	63,740	56.4%	1,239	35,949
Division 56	9,074	313,510	41.1%	3,729	128,853
Division 79	1,712	30,447	91.7%	1,569	27,906
Division 91	618	19,116	12.7%	78	2,428
Division 92	453	20,956	12.1%	55	2,528
Division 93	2,255	76,363	8.5%	191	6,459
All other industries	295,434	4,837,223	0.8%	2,363	38,698
TOTAL				12,319	290,560

A	Modelled GVA in the tourism industry, 2015, £ billion	12.32
B	Modelled workforce jobs in the tourism industry, 2015	290,560
C	GVA per workforce job, tourism industry, 2015	= A / B = £42,399

Source: GLA Economics calculations

It is estimated that the GVA per workforce job in the tourism industry is approximately £42,399 (in 2015 nominal prices), which compares to an average GVA per workforce job across all sectors of the economy in London of £58,442; therefore approximately 27.5 per cent lower than the average GVA per workforce job in London. This is to be expected, since major components of the tourism industry are in Accommodation and Food services; and Arts, Entertainment and Recreation; sections which typically have lower than average GVA per workforce job estimates.

Appendix B-2: Creative Industries

The analysis in this appendix is drawn upon analysis undertaken by DCMS, specifically using the definition of the creative industries based upon the selection of 4 digit SIC07 industry groups. Table A.2 outlines the specific 4 digit SIC07 groups contained within the creative industries, alongside the broader creative industries group in which each individual SIC industry resides in.

Table B.2: Specific industries contained within the Creative Industries

Creative Industries Group	SIC Code	Industry Description
Advertising and marketing	70.21	Public relations and communication activities
	73.11	Advertising agencies
	73.12	Media representation
Architecture	71.11	Architectural activities
Crafts	32.12	Manufacture of jewellery and related articles
Design: product, graphic and fashion design	74.10	Specialised design activities
Film, TV, video, radio and photography	59.11	Motion picture, video and television programme production activities
	59.12	Motion picture, video and television programme post-production
	59.13	Motion picture, video and television programme distribution
	59.14	Motion picture projection activities
	60.10	Radio broadcasting
	60.20	Television programming and broadcasting activities
	74.20	Photographic activities
IT, software and computer services	58.21	Publishing of computer games
	58.29	Other software publishing
	62.01	Computer programming activities
	62.02	Computer consultancy activities
Publishing	58.11	Book publishing
	58.12	Publishing of directories and mailing lists
	58.13	Publishing of newspapers
	58.14	Publishing of journals and periodicals
	58.19	Other publishing activities
	74.30	Translation and interpretation activities
Museums, galleries and libraries	91.01	Library and archive activities
	91.02	Museum activities
Music, performing and visual arts	59.20	Sound recording and music publishing activities
	85.52	Cultural education
	90.01	Performing arts
	90.02	Support activities to performing arts
	90.03	Artistic creation
	90.04	Operation of arts facilities

Source: Department for Culture, Media and Sport.

The methodology to derive the specific industry output and workforce jobs is based upon the methodology set out within this paper; however the following section outlines in more detail the specific calculation steps required to generate the final estimates of GVA, employment and GVA per workforce job for the creative industries.

Step 1: Calculation of GVA and workforce job estimates at the division level

Using the methodology set out within this paper, and in a similar way to the previous case study on tourism GVA per workforce job, GVA and workforce jobs by division are modelled and are shown in the following table:

Table B.3: Modelled GVA and workforce jobs for divisions relating to creative industries, London

Division	Modelled GVA (£m)	Modelled workforce jobs
32: Other manufacturing	399	6,579
58: Publishing activities	6,022	65,656
59: Motion picture, video and television programme production, sound recording and music publishing activities	5,790	71,039
60: Programming and broadcasting activities	3,031	30,184
62: Computer programming, consultancy and related activities	19,143	196,582
70: Activities of head offices; management consultancy activities	16,713	270,501
71: Architectural and engineering activities; technical testing and analysis	4,956	100,412
73: Advertising and market research	4,406	89,758
74: Other professional, scientific and technical activities	3,253	76,087
85: Education	17,657	420,500
90: Creative, arts and entertainment activities	3,487	85,564
91: Libraries, archives, museums and other cultural activities	618	19,116

Source: GLA Economics calculations. Modelled workforce jobs are rounded to the nearest hundred (however unrounded data are used for subsequent calculations).

After undertaking these two steps, the estimates of division level GVA and workforce jobs have been set, and the subsequent modelling takes account of the relative shares of employee jobs within each of the individual 4 digit SIC07 groups within the 2 digit SIC07 divisions.

Step 2: Using BRES data to apportion out division level GVA and workforce jobs

Within each of the industries outlined in Table A1, BRES data has been used to determine the proportion of total division level employees that are comprised by the specific 4 digit SIC07 groups.

Division 32: Other manufacturing

Modelled division level GVA	£399 million
Modelled division level WFJ	6,579

Group	Employees	Share of Total Division	Modelled Creative GVA (£m)	Modelled Creative WFJ
32.12: Manufacture of jewellery and related articles	800	20.5%	82	1,349

Division 58: Publishing activities

Modelled division level GVA	£6,022 million
Modelled division level WFJ	65,656

Group	Employees	Share of Total Division	Modelled Creative GVA (£m)	Modelled Creative WFJ
58.11: Book publishing	12,100	21.5%	1,294	14,111
58.12: Publishing of directories and mailing lists	200	0.4%	21	233
58.13: Publishing of newspapers	13,600	24.2%	1,455	15,860
58.14: Publishing of journals and periodicals	20,600	36.6%	2,203	24,023
58.19: Other publishing activities	5,700	10.1%	610	6,647
58.21: Publishing of computer games	500	0.9%	53	583
58.29 Other software publishing	3,500	6.2%	374	4,082

Division 59: Motion picture, video and television programme production, sound recording and music publishing activities

Modelled division level GVA	£5,790 million
Modelled division level WFJ	71,039

Group	Employees	Share of Total Division	Modelled Creative GVA (£m)	Modelled Creative WFJ
59.11: Motion picture, video and television programme production activities	30,900	57.3%	3,319	40,725
59.12: Motion picture, video and television programme post-production	8,900	16.5%	956	11,730
59.13: Motion picture, video and television programme distribution	4,700	8.7%	505	6,194
59.14: Motion picture projection activities	3,700	6.9%	397	4,877
59.20: Sound recording and music publishing activities	5,700	10.6%	612	7,512

Division 60: Programming and broadcasting activities

Modelled division level GVA	£3,031 million
Modelled division level WFJ	30,184

Group	Employees	Share of Total Division	Modelled Creative GVA (£m)	Modelled Creative WFJ
60.10: Radio broadcasting	7,300	26.6%	807	8,042
60.20: Television programming and broadcasting activities	20,100	73.4%	2,223	22,142

Division 62: Computer programming, consultancy and related activities

Modelled division level GVA	£19,143 million
Modelled division level WFJ	196,582

Group	Employees	Share of Total Division	Modelled Creative GVA (£m)	Modelled Creative WFJ
62.01: Computer programming activities	41,600	24.1%	4,616	47,408
62.02: Computer consultancy activities	98,300	57.0%	10,908	112,023

Division 70: Activities of head offices; management consultancy activities

Modelled division level GVA	£16,713 million
Modelled division level WFJ	270,501

Group	Employees	Share of Total Division	Modelled Creative GVA (£m)	Modelled Creative WFJ
70.21: Public relations and communication activities	13,600	5.4%	895	14,489

Division 71: Architectural and engineering activities; technical testing and analysis

Modelled division level GVA	£4,956 million
Modelled division level WFJ	100,412

Group	Employees	Share of Total Division	Modelled Creative GVA (£m)	Modelled Creative WFJ
71.11: Architectural activities	29,500	33.7%	1,671	33,853

Division 73: Advertising and market research

Modelled division level GVA	£4,406 million
Modelled division level WFJ	89,758

Group	Employees	Share of Total Division	Modelled Creative GVA (£m)	Modelled Creative WFJ
73.11: Advertising agencies	48,300	61.8%	2,722	55,439
73.12: Media representation	9,400	12.0%	530	10,789

Division 74: Other professional, scientific and technical activities

Modelled division level GVA	£3,253 million
Modelled division level WFJ	76,087

Group	Employees	Share of Total Division	Modelled Creative GVA (£m)	Modelled Creative WFJ
74.10: Specialised design activities	15,200	37.3%	1,215	28,416
74.20: Photographic activities	4,800	11.8%	384	8,973
74.30: Translation and interpretation activities	1,200	2.9%	96	2,243

Division 85: Education

Modelled division level GVA	£17,657 million
Modelled division level WFJ	420,500

Group	Employees	Share of Total Division	Modelled Creative GVA (£m)	Modelled Creative WFJ
85.52: Cultural education	1,400	0.4%	64	1,523

Division 90: Creative, arts and entertainment activities

Modelled division level GVA	£3,487 million
Modelled division level WFJ	85,564

Group	Employees	Share of Total Division	Modelled Creative GVA (£m)	Modelled Creative WFJ
90.01: Performing arts	16,000	48.9%	1,706	41,866
90.02: Support activities to performing arts	3,000	9.2%	320	7,850
90.03: Artistic creation	9,400	28.7%	1,002	24,596
90.04: Operation of arts facilities	4,400	13.5%	469	11,513

Division 91: Libraries, archives, museums and other cultural activities

Modelled division level GVA	£618 million
Modelled division level WFJ	19,116

Group	Employees	Share of Total Division	Modelled Creative GVA (£m)	Modelled Creative WFJ
91.01: Library and archive activities	6,200	33.2%	205	6,338
91.02: Museum activities	9,000	48.1%	297	9,200

Step 4: Calculation of the total GVA through the creative industries

Using the specific 4 digit SIC07 groups contained within the Creative Industry Groups outlined in Table B.2, the total GVA of the creative industries for London can be calculated, and is shown in the table below:

Creative Industries Group	GVA (£ million)
Advertising and marketing	4,146
Architecture	1,671
Crafts	82
Design: product, graphic and fashion design	1,215
Film, TV, video, radio and photography	8,592
IT, software and computer services	15,953
Publishing	5,679
Museums, galleries and libraries	502
Music, performing and visual arts	4,173
TOTAL	42,014

It is therefore estimated that the creative industries in London were worth £42.0 billion in GVA in 2015.

Derivation of the GVA per workforce job in the creative industries in London

One additional modelling step has to be undertaken in order to derive the estimate of GVA per workforce job for the creative industries (and its component groups). This Working Paper has stated the expressed aim that only the proportion of published GVA directly attributable to the workforce should be used towards the calculations of GVA per workforce job. Within each of the individual components of published GVA, some will be relevant activities of the workforce and, arguably, some will not. The latter primarily relates to rental incomes. For the analysis that follows, the modelled creative GVA for each 4 digit SIC07 group is multiplied by the proportion of published GVA attributable to the workforce, for the 1 digit SIC07 section in which the group resides in. The following table outlines the proportions of published GVA attributable to the workforce for London, and states the 4 digit SIC07 groups which relate to each section.

Section	Creative industry 4 digit SIC07 groups	Proportion of GVA attributable to the workforce
C: Manufacturing	32.12	97.6%
J: Information and Communication	58.11-58.29; 59.11-59.20; 60.10-60.20; 62.01-62.02	99.4%
M: Professional, scientific and technical activities	70.21, 71.11; 73.11-73.12; 74.10-74.30	99.5%
P: Education	85.52	99.7%
R: Arts, entertainment and recreation	90.01-90.04; 91.01-91.02	99.5%

Source: GLA Economics calculations

With these proportions, data on attributable GVA by 4 digit SIC07 group can be calculated; and combined with data on modelled WFJ, the estimates of GVA per workforce job by creative industry group are shown in the table below:

Creative Industry Group	Attributable GVA (£m)	Modelled Workforce Jobs	GVA per workforce job
Advertising and marketing	4,125	80,718	£51,108
Architecture	1,663	33,853	£49,110
Crafts	80	1,349	£59,214
Design: product, graphic and fashion design	1,208	28,416	£42,538
Film, TV, video, radio and photography	8,539	102,684	£83,154
IT, software and computer services	15,852	164,096	£96,604
Publishing	5,643	63,118	£89,410
Museums, galleries and libraries	500	15,538	£32,173
Music, performing and visual arts	4,153	94,861	£43,776
TOTAL	41,763	584,633	£71,435

Source: GLA Economics calculations; unrounded data have been used towards the derivation of GVA, workforce jobs; and hence GVA per workforce job. Other data presented in this appendix are presented as rounded values.

It is therefore estimated that the GVA per workforce job in the creative industries stood at £71,435 in 2015; which compares to an average GVA per workforce job across all sectors in London of £58,442, therefore approximately 22 per cent higher than the all sector average.

Appendix C: GVA per workforce job estimate timeseries, 1 digit SIC sections

i) London

A full time series dataset is available for 1997 – 2015, and can be found on the London Datastore publication accompanying this report. Here only selected years in the backseries have been shown, as well as the last four years of data.

	Sector Description	1997	2002	2007	2012	2013	2014	2015
A	Agriculture, Forestry and Fishing	£9,750	£6,400	£16,316	£33,744	£62,703	£40,409	£40,409
B	Mining and Quarrying	£72,614	£134,505	£55,521	£54,352	£49,430	£50,641	£50,433
C	Manufacturing	£38,566	£45,427	£50,418	£63,061	£69,712	£59,537	£67,310
D	Electricity, Gas, Steam and Air Conditioning Supply	£121,675	£220,361	£300,531	£441,350	£404,507	£417,224	£327,606
E	Water Supply, Sewerage, Waste Management	£41,708	£58,433	£90,889	£89,117	£94,293	£73,837	£88,950
F	Construction	£29,929	£37,604	£47,242	£50,419	£50,934	£54,850	£51,441
G	Wholesale and Retail Trade, Repair of Motor Vehicles	£28,522	£29,940	£39,547	£40,137	£41,977	£45,810	£45,795
H	Transportation and Storage	£41,620	£42,299	£46,200	£55,119	£57,138	£63,123	£63,052
I	Accommodation and Food Service	£18,712	£21,144	£23,944	£27,303	£27,756	£28,561	£29,875
J	Information and Communication	£56,335	£67,462	£82,198	£91,871	£90,993	£88,589	£94,290
K	Financial and Insurance Activities	£60,401	£62,125	£144,864	£144,768	£157,458	£167,017	£159,447
L	Real Estate	£28,638	£48,698	£48,221	£66,811	£64,169	£73,225	£69,314
M	Professional, Scientific and Technical Activities	£33,442	£47,351	£53,982	£56,714	£55,645	£55,356	£56,741
N	Administrative and Support Services	£18,586	£23,126	£27,375	£34,757	£36,937	£36,663	£37,548
O	Public Administration and Defence	£28,362	£31,133	£44,831	£54,367	£53,302	£55,661	£53,725
P	Education	£28,154	£33,250	£41,239	£44,805	£41,904	£42,597	£41,990
Q	Human Health and Social Work	£20,160	£28,067	£37,937	£34,886	£32,878	£33,492	£38,017
R	Arts, Entertainment and Recreation	£24,287	£30,567	£33,342	£36,911	£33,900	£34,073	£33,728
S	Other Service Activities	£24,292	£31,048	£36,327	£52,415	£46,770	£48,282	£48,277
T	Activities of households	£42,943	£27,143	£28,816	£74,629	£71,309	£65,185	£160,078
A-T	Overall	£32,653	£38,294	£51,333	£56,272	£56,336	£57,698	£58,442
	Overall (excluding Finance & Insurance Activities)	£30,216	£36,304	£43,960	£49,162	£48,895	£49,967	£51,244

ii) UK

	Sector Description	1997	2002	2007	2012	2013	2014	2015
A	Agriculture, Forestry and Fishing	£18,766	£23,289	£22,122	£22,827	£27,754	£24,458	£26,230
B	Mining and Quarrying	£226,110	£324,094	£446,868	£376,858	£390,270	£351,835	£240,633
C	Manufacturing	£33,598	£37,250	£46,766	£57,389	£61,821	£62,772	£61,605
D	Electricity, Gas, Steam and Air Conditioning Supply	£121,279	£130,041	£189,284	£164,808	£192,693	£204,244	£182,798
E	Water Supply, Sewerage, Waste Management	£49,343	£65,365	£98,353	£90,597	£87,200	£85,880	£84,421
F	Construction	£22,791	£31,480	£38,522	£39,764	£41,445	£43,019	£44,971
G	Wholesale and Retail Trade, Repair of Motor Vehicles	£20,294	£24,023	£29,844	£32,528	£33,768	£35,554	£35,920
H	Transportation and Storage	£30,991	£33,738	£37,150	£41,185	£44,643	£48,063	£47,778
I	Accommodation and Food Service	£11,666	£15,117	£17,813	£19,942	£21,295	£21,265	£21,896
J	Information and Communication	£47,820	£55,552	£67,406	£74,451	£75,019	£74,045	£77,882
K	Financial and Insurance Activities	£40,371	£39,532	£92,308	£91,167	£97,934	£100,974	£100,917
L	Real Estate	£25,971	£33,531	£32,841	£44,152	£41,860	£45,320	£49,192
M	Professional, Scientific and Technical Activities	£28,017	£36,489	£41,038	£41,683	£42,170	£42,207	£42,279
N	Administrative and Support Services	£14,482	£19,704	£22,341	£25,703	£26,998	£26,761	£27,327
O	Public Administration and Defence	£26,899	£31,356	£39,906	£51,131	£51,901	£53,067	£52,805
P	Education	£21,197	£26,601	£32,186	£34,775	£34,609	£34,121	£33,041
Q	Human Health and Social Work	£16,835	£21,733	£27,639	£28,440	£27,611	£28,114	£30,861
R	Arts, Entertainment and Recreation	£15,052	£18,244	£21,939	£24,683	£24,265	£23,884	£23,396
S	Other Service Activities	£18,066	£22,249	£29,601	£38,131	£38,139	£38,128	£38,970
T	Activities of households	£40,059	£31,417	£34,531	£86,429	£90,358	£76,349	£109,225
A-T	Overall	£25,084	£29,752	£37,381	£40,831	£41,986	£42,418	£42,918

Appendix D: Calculation of 2 digit SIC division level GVA per workforce job estimates

The following table provides the data used towards the calculations of GVA per workforce job at the division level, London, 2015. Data provided for Sections F – S; excluding L, P and O.

Section and Division	Published GVA (£million)	Proportion of attributable GVA (%)	Attributable GVA (£million)	Employee jobs (BRES)	Self-employment jobs (APS)	Attributable GVA (£million)	Gross hourly wage, all employee jobs (£)	Proportion of productivity adjusted wage (%)	Productivity adjusted GVA (£million)	Modelled workforce jobs	GVA per workforce job estimate (£)
F – 41	16,020	92.6	14,828	55,600	74,000	6,173	20.62	45.9	6,805	120,004	56,704
F – 42				25,200	8,000	1,581	19.36	11.0	1,637	30,742	53,239
F – 43				58,500	90,000	7,073	16.89	43.1	6,387	137,504	46,446
G – 45	31,310	98.4	30,797	40,300	5,000	2,100	12.13	5.5	1,701	45,859	37,097
G – 46				149,300	9,000	7,339	19.03	30.3	9,327	160,254	58,199
G – 47				426,700	34,000	21,358	13.86	64.2	19,769	466,387	42,388
H – 49	17,872	99.3	17,749	94,200	59,000	9,335	18.64	49.1	8,708	148,046	58,819
H – 50				5,600	-	341	27.08	2.6	462	5,412	85,452
H – 51				37,200	-	2,267	27.22	17.4	3,088	35,949	85,893
H – 52				61,300	-	3,735	20.64	21.7	3,858	59,238	65,130
H – 53				29,000	5,000	2,072	15.75	9.2	1,633	32,856	49,699
I – 55	11,398	98.9	11,270	63,100	2,000	1,904	11.30	19.5	2,197	63,740	34,462
I – 56				307,200	13,000	9,366	9.49	80.5	9,074	313,510	28,942
J – 58	41,110	99.4	40,851	56,300	12,000	6,191	23.00	14.7	6,022	65,656	91,714
J – 59				53,900	20,000	6,698	20.44	14.2	5,790	71,039	81,506
J – 60				27,400	4,000	2,846	25.18	7.4	3,031	30,184	100,407
J – 61				40,800	-	3,698	23.92	9.2	3,741	39,220	95,383
J – 62				172,500	32,000	18,536	24.42	46.9	19,143	196,582	97,377
J – 63				31,800	-	2,882	25.64	7.7	3,125	30,569	102,242
K – 64	61,703	96.5	59,514	177,400	13,000	29,594	41.37	54.0	32,138	185,601	173,154
K – 65				18,500	1,000	3,031	31.57	4.2	2,509	19,009	132,010
K – 66				157,000	16,000	26,889	35.23	41.8	24,867	168,640	147,455

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M – 69	43,742	99.5	43,520	179,900	42,000	11,871	27.73	29.9	13,034	209,216	62,301
M – 70				253,900	33,000	15,348	27.50	38.4	16,713	270,501	61,784
M – 71				87,500	19,000	5,698	21.97	11.4	4,956	100,412	49,360
M – 72				18,200	-	974	25.94	2.3	1,000	17,160	58,279
M – 73				78,200	17,000	5,093	21.85	10.1	4,406	89,758	49,090
M – 74				40,700	40,000	4,317	19.03	7.5	3,253	76,087	42,754
M – 75				4,100	-	219	18.17	0.4	158	3,866	40,822
N – 77	21,879	98.6	21,581	18,200	2,000	747	14.05	3.5	748	19,904	37,593
N – 78				177,200	6,000	6,778	14.07	31.5	6,797	180,515	37,646
N – 79				25,900	5,000	1,143	21.02	7.9	1,712	30,447	56,242
N – 80				64,700	1,000	2,431	9.79	7.9	1,696	64,737	26,195
N – 81				147,500	42,000	7,011	11.31	26.2	5,651	186,722	30,262
N – 82				88,800	5,000	3,470	20.13	23.1	4,978	92,425	53,861
Q – 86	20,859	99.6	20,786	298,300	37,000	12,477	19.89	68.7	14,287	328,187	43,533
Q – 87				61,600	5,000	2,478	11.88	8.2	1,695	65,187	26,002
Q – 88				140,700	16,000	5,831	14.31	23.1	4,804	153,376	31,320
R – 90	6,846	99.5	6,813	32,700	51,000	2,886	21.44	51.2	3,487	85,564	40,748
R – 91				18,700	-	645	17.01	9.1	618	19,116	32,328
R – 92				20,500	-	707	11.38	6.7	453	20,956	21,628
R – 93				56,700	18,000	2,576	15.54	33.1	2,255	76,363	29,535
S – 94	7,116	99.6	7,085	62,100	9,000	3,399	20.27	59.3	4,201	7,040	59,671
S – 95				5,300	4,000	445	17.57	6.7	476	9,209	51,723
S – 96				44,800	23,000	3,241	12.18	34.0	2,407	67,137	35,855

Appendix E: 1 digit SIC section level GVA per workforce job estimates, by region, 2015

	Sector Description	London	UK	Scotland	Wales	Northern Ireland	East	East Mid.	North East	North West	South East	South West	West Mid.	Yorks & Humber
A	Agriculture, Forestry and Fishing	£40,409	£26,230	£31,441	£8,905	£10,470	£40,843	£34,252	£45,630	£16,634	£27,486	£20,927	£21,010	£34,537
B	Mining and Quarrying	£50,433	£240,633	£52,805	£70,965	£62,000	£60,974	£78,985	£144,289	£67,149	£83,388	£74,287	£44,011	£46,823
C	Manufacturing	£67,310	£61,605	£72,376	£56,752	£59,391	£72,608	£58,065	£57,001	£74,209	£69,707	£58,629	£56,329	£51,923
D	Electricity, Gas, Steam and Air Conditioning Supply	£327,606	£182,798	£164,183	£112,065	£161,091	£166,416	£147,697	£190,134	£147,977	£222,277	£233,597	£198,788	£141,887
E	Water Supply, Sewerage, Waste Management	£88,950	£84,421	£95,561	£74,903	£104,688	£77,140	£82,177	£100,595	£70,969	£91,443	£92,253	£82,530	£83,778
F	Construction	£51,441	£44,971	£46,403	£33,238	£33,119	£44,412	£41,964	£43,834	£41,393	£47,420	£38,700	£41,730	£38,896
G	Wholesale and Retail Trade, Repair of Motor Vehicles	£45,795	£35,920	£35,570	£26,223	£34,652	£36,830	£34,879	£29,829	£33,967	£42,757	£32,838	£29,150	£31,500
H	Transportation and Storage	£63,052	£47,778	£46,537	£37,214	£41,901	£51,763	£43,173	£40,785	£42,481	£51,518	£40,318	£40,857	£44,084
I	Accommodation and Food Service	£29,875	£21,896	£20,403	£16,624	£18,868	£20,987	£18,700	£17,680	£20,416	£22,274	£21,589	£22,045	£18,248
J	Information and Communication	£94,290	£77,882	£70,909	£56,156	£54,510	£64,818	£63,839	£70,580	£64,826	£85,299	£60,609	£68,152	£58,492
K	Financial and Insurance Activities	£159,447	£100,917	£88,355	£56,101	£63,596	£70,049	£55,624	£62,674	£69,298	£76,669	£68,627	£71,811	£74,047
L	Real Estate	£69,314	£49,192	£42,652	£31,996	£44,825	£48,326	£44,551	£37,769	£37,811	£43,925	£31,963	£39,038	£36,371
M	Professional, Scientific and Technical Activities	£56,741	£42,279	£40,663	£28,757	£34,128	£42,859	£29,551	£29,542	£34,375	£45,085	£34,401	£32,437	£32,173
N	Administrative and Support Services	£37,548	£27,327	£25,059	£21,467	£21,934	£23,885	£21,434	£22,162	£25,727	£29,726	£26,228	£24,226	£21,805
O	Public Administration and Defence	£53,725	£52,805	£49,477	£48,239	£63,877	£55,415	£53,200	£50,526	£42,016	£59,052	£61,641	£48,653	£49,481
P	Education	£41,990	£33,041	£37,533	£29,826	£31,974	£31,401	£30,673	£33,065	£32,883	£32,166	£28,078	£30,654	£32,548
Q	Human Health and Social Work	£38,017	£30,861	£31,893	£29,215	£28,901	£30,308	£29,426	£29,080	£30,629	£31,330	£28,256	£29,461	£28,659
R	Arts, Entertainment and Recreation	£33,728	£23,396	£24,153	£13,647	£20,898	£21,593	£21,212	£17,640	£24,181	£24,732	£15,616	£19,604	£16,249

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S	Other Service Activities	£48,277	£38,970	£41,565	£34,060	£32,464	£37,599	£35,896	£25,517	£33,001	£43,072	£35,779	£39,453	£33,755
T	Activities of households	£160,078	£109,225	£39,733	£66,000	£324,000	£113,765	£73,500	£64,800	£101,455	£88,571	£134,087	£108,923	£129,846
A-T	Overall	£58,442	£42,918	£41,914	£33,265	£36,915	£40,964	£37,717	£36,633	£38,770	£44,994	£37,268	£37,316	£36,124

Appendix F: Real terms GVA per workforce job estimates

F.1: Real terms estimates, London, 1997 – 2015, selected years. All data in 2013 prices.

	Sector Description	1997	2002	2007	2012	2013	2014	2015
A	Agriculture, Forestry and Fishing	£7,786	£5,872	£13,297	£30,482	£62,703	£49,159	£49,720
B	Mining and Quarrying	£92,802	£103,306	£44,811	£42,830	£49,430	£57,612	£56,823
C	Manufacturing	£47,394	£57,721	£63,023	£68,995	£69,712	£58,831	£65,778
D	Electricity, Gas, Steam and Air Conditioning Supply	£200,718	£397,764	£439,372	£521,690	£404,507	£375,202	£287,929
E	Water Supply, Sewerage, Waste Management	£63,047	£71,434	£89,546	£79,498	£94,293	£75,730	£88,820
F	Construction	£54,690	£51,583	£51,017	£51,659	£50,934	£56,199	£51,350
G	Wholesale and Retail Trade, Repair of Motor Vehicles	£38,090	£36,072	£43,554	£39,977	£41,977	£45,044	£44,323
H	Transportation and Storage	£51,945	£53,073	£59,079	£58,512	£57,138	£60,232	£59,329
I	Accommodation and Food Service	£28,315	£28,419	£30,156	£30,712	£27,756	£28,139	£28,945
J	Information and Communication	£52,118	£68,350	£83,876	£92,333	£90,993	£85,511	£91,093
K	Financial and Insurance Activities	£97,096	£98,925	£159,542	£156,000	£157,458	£163,262	£151,433
L	Real Estate	£32,385	£53,573	£50,919	£65,373	£64,169	£70,274	£66,032
M	Professional, Scientific and Technical Activities	£41,617	£49,634	£58,804	£57,636	£55,645	£54,971	£55,769
N	Administrative and Support Services	£22,437	£24,242	£28,695	£34,862	£36,937	£37,758	£38,289
O	Public Administration and Defence	£53,221	£47,970	£54,672	£55,818	£53,302	£54,357	£50,968
P	Education	£59,498	£51,391	£47,620	£45,167	£41,904	£42,768	£40,696
Q	Human Health and Social Work	£26,600	£32,187	£36,269	£33,512	£32,878	£32,835	£36,620
R	Arts, Entertainment and Recreation	£46,128	£45,285	£41,265	£38,289	£33,900	£32,857	£31,596
S	Other Service Activities	£48,833	£49,676	£44,737	£55,116	£46,770	£51,309	£49,691
T	Activities of households	£83,709	£40,512	£32,560	£77,819	£71,309	£60,413	£143,957
A-T	Overall	£43,727	£47,276	£56,472	£57,421	£56,336	£56,790	£56,562

F.2: Real terms indices; selected years, 2008 = 100

	Sector Description	1997	2002	2008	2012	2013	2014	2015
A	Agriculture, Forestry and Fishing	60.9	45.9	100.0	238.3	490.1	384.3	388.6
B	Mining and Quarrying	129.6	144.3	100.0	59.8	69.0	80.4	79.3
C	Manufacturing	79.3	96.5	100.0	115.4	116.6	98.4	110.0
D	Electricity, Gas, Steam and Air Conditioning Supply	44.0	87.3	100.0	114.5	88.8	82.3	63.2
E	Water Supply, Sewerage, Waste Management	76.5	86.7	100.0	96.5	114.4	91.9	107.8
F	Construction	109.3	103.1	100.0	103.2	101.8	112.3	102.6
G	Wholesale and Retail Trade, Repair of Motor Vehicles	89.0	84.3	100.0	93.4	98.1	105.3	103.6
H	Transportation and Storage	87.5	89.4	100.0	98.5	96.2	101.4	99.9
I	Accommodation and Food Service	95.7	96.1	100.0	103.8	93.8	95.1	97.9
J	Information and Communication	60.8	79.7	100.0	107.6	106.1	99.7	106.2
K	Financial and Insurance Activities	61.8	63.0	100.0	99.4	100.3	104.0	96.5
L	Real Estate	47.7	79.0	100.0	96.4	94.6	103.6	97.3
M	Professional, Scientific and Technical Activities	71.1	84.7	100.0	98.4	95.0	93.9	95.2
N	Administrative and Support Services	78.8	85.2	100.0	122.5	129.8	132.7	134.5
O	Public Administration and Defence	96.8	87.2	100.0	101.5	96.9	98.8	92.7
P	Education	128.5	111.0	100.0	97.6	90.5	92.4	87.9
Q	Human Health and Social Work	80.8	97.7	100.0	101.7	99.8	99.7	111.2
R	Arts, Entertainment and Recreation	113.8	111.8	100.0	94.5	83.7	81.1	78.0
S	Other Service Activities	108.0	109.9	100.0	121.9	103.5	113.5	109.9
T	Activities of households	203.3	98.4	100.0	189.0	173.2	146.7	349.6
A-T	Overall	78.7	85.1	100.0	103.4	101.4	102.2	101.8

GLAECONOMICS

Greater London Authority
City Hall
The Queens Walk
London SE1 2AA

Tel 020 7983 4922
Fax 020 7983 4674
Minicom 020 7983 4000
Email glaeconomics@london.gov.uk

<http://www.london.gov.uk/gla-economics-publications>

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