

Article

International Comparisons of Productivity Summary

An international comparison of productivity across the G7 nations, in terms of the level of and growth in GDP per hour and GDP per worker.



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1. Introduction

This short article summarises our recent [International comparisons of productivity - final estimates, 2014](#) release, which contains annual estimates of labour productivity for the G7 developed countries (Canada, France, Germany, Italy, Japan, UK and USA) up to 2014.

International comparisons are presented in 2 distinct ways. Firstly in terms of current prices, using nominal measures of economic output as numerators. These estimates are suitable for cross-country comparison of levels of productivity for a single year and, since productivity is an important determinant of living standards, provide point-in-time indications of living standards relative to the UK. Second, productivity is presented in terms of constant prices, using real (inflation-adjusted) measures of economic output as numerators. These estimates are similar to national labour productivity metrics and describe the evolution of productivity over time. Additionally, the latest ICP release presents an analysis of comparisons of labour productivity for sub-sections of the economy. These comparisons employ the same methodology as the current price estimates for the whole economy, but are not wholly consistent with the whole economy estimates and are not National Statistics.

While the estimates used in the [ICP bulletin](#) are similar to the ones used in our [labour productivity bulletin](#) there are some differences in methodology and sources. The labour productivity statistical bulletin is published quarterly, providing more timely and detailed measures of UK productivity. In contrast ICP estimates are annual and are published biannually. Provisional annual results are normally published 9 months after the reference period and finalised annual results 14 months after the reference period. This schedule reflects the publication and revision cycles of the Organisation for Economic Co-operation and Development (OECD) sources used for ICP estimates.

With some minor exceptions, the source data used for ICP are published by the OECD, while the labour productivity release uses Office for National Statistics (ONS) data. With regards to labour input, ONS labour productivity use calendar quarter estimates from the Labour Force Survey (LFS) for total employment, total jobs (defined as workers in employment plus workers with second jobs) and hours worked. Annual labour productivity estimates are derived as simple averages of calendar quarter estimates.

ICP estimates use OECD annual estimates of total employment and of average annual actual hours worked. These OECD estimates differ in 2 respects from the estimates used in ONS labour productivity estimates. First, OECD adjusts all labour force data it receives from individual countries, for example, in order to harmonise the treatment of armed forces across countries. Second, there are compilation differences in the calculation of total hours worked. Hence, there may be some differences from what is published in national sources. Also, there may be timing differences if national sources are updated outside the OECD revision cycle.

In addition, the output measure used (GDP in market prices) differs from that in the labour productivity bulletin (gross value added (GVA) in basic prices, that is, net of indirect taxes and subsidies). There are 2 reasons for this: firstly, because PPPs are implicitly based on market prices rather than basic prices; and secondly, because internationally comparable measures of GVA are not readily available.

In order to make international comparisons, output is converted into a common currency using purchasing power parities (PPPs). The PPPs used are derived from a joint programme between the OECD and Eurostat to establish for each year the cost of a representative basket of goods and services in national currencies. Therefore, PPPs can be thought of as synthetic exchange rates which equalise the cost of a representative basket of goods and services across countries. In the short run, PPP exchange rates can differ from market exchange rates.

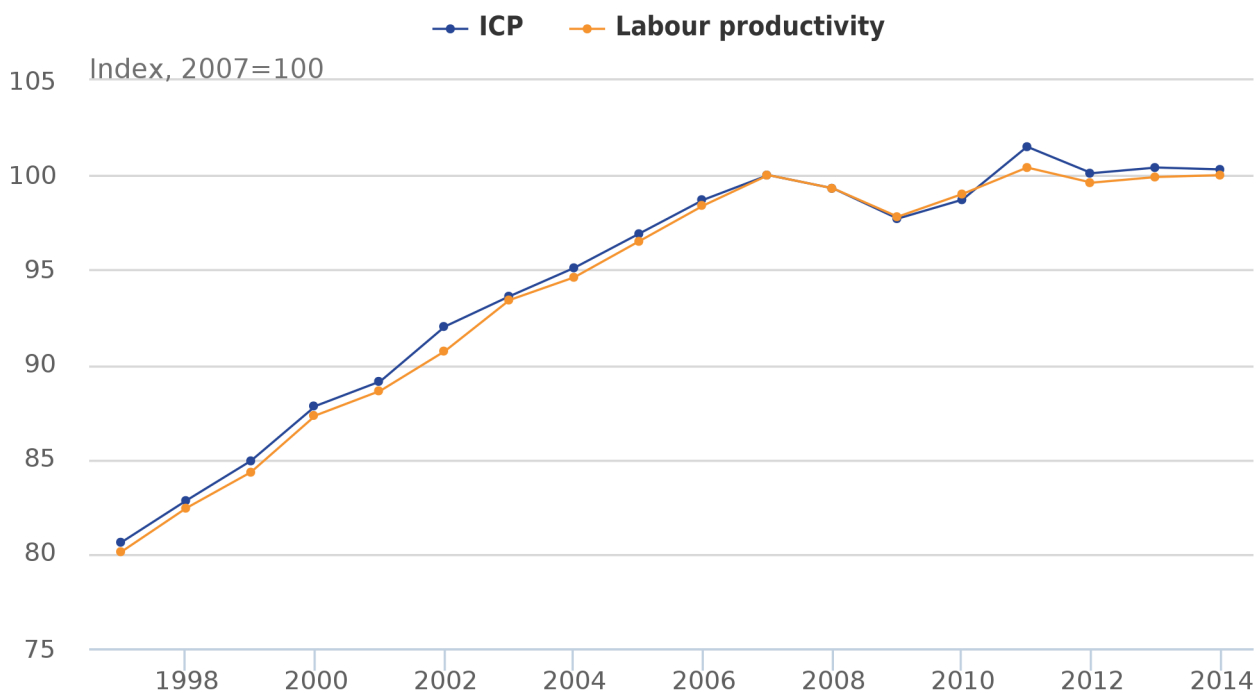
To calculate productivity levels, the value of economic output in local currency units is converted to a common currency using PPP exchange rates for each year and then divided by the appropriate labour input.

To compare growth rates of productivity for multi-country aggregates such as the G7 and G7 excluding UK, current price GDP for each country is calculated in a common currency (US \$) in a base year, reflecting the OECD's PPPs benchmark year, when the analysis of price structures will be most accurate. This is then extrapolated forward and backward by applying annual growth rates of constant price productivity. It should be noted that this methodology is used solely to compile time series of multi-country aggregate productivity; converting from national currency to US \$ has no effect on productivity growth.

Figure 1 compares ICP and labour productivity output per hour estimates between 1997 and 2014. Despite small differences between GVA and GDP, the main differences between the 2 series are due to employment and average hours. For example, in 2011 OECD estimates show total UK hours falling by 0.8%, whereas LFS shows a rise of 0.4%. This means a difference in productivity growth of 1.2%. Most of the differences are due to average hours. In 2011 the LFS estimates a 0.1% fall in average hours per worker, while the OECD average annual hours estimate fell by 1.6%. However, while there are some differences in certain years, the overall picture is very similar. The rest of this article goes on to summarise ICP final estimates for 2014.

Figure 1: Comparison of ICP and labour productivity estimates of output per hour

1997 to 2014



Source: Office for National Statistics

2. Main points

Output per hour in the G7 excluding the UK was 18% above that of the UK in 2014, the widest productivity gap since comparable estimates began in 1991.

Across the G7 as a whole, labour productivity as measured by real (inflation adjusted) output per hour and output per worker grew modestly in 2014. Output per hour was lower in all G7 countries in 2014 than would have been the case if pre-downturn trends had continued since 2007. The UK's "productivity gap" of about 14% is about twice as large as the gap for the rest of the G7.

Productivity comparisons for sub-sectors of the economy between the UK, the US, Germany, France and Italy show that UK productivity lagged behind the US in all sub-sectors and particularly in manufacturing, but that comparisons with other European countries are more mixed.

For manufacturing, UK output per hour is estimated to be above that of Italy and UK output per worker is a little higher than equivalent estimates for Germany and France.

In financial services, the UK's comparative productivity has deteriorated sharply since 2009 and trails France and Italy as well as the US.

For private non-financial services (which easily comprises the largest component of the UK economy), the UK's comparative productivity has also deteriorated since 2009 and UK output per hour trails well behind France, Germany and the US. Bearing in mind the weight of private non-financial services in the whole economy, the shortfall here would seem to account for a significant part of the differences in comparative labour productivity identified in the whole economy estimates.

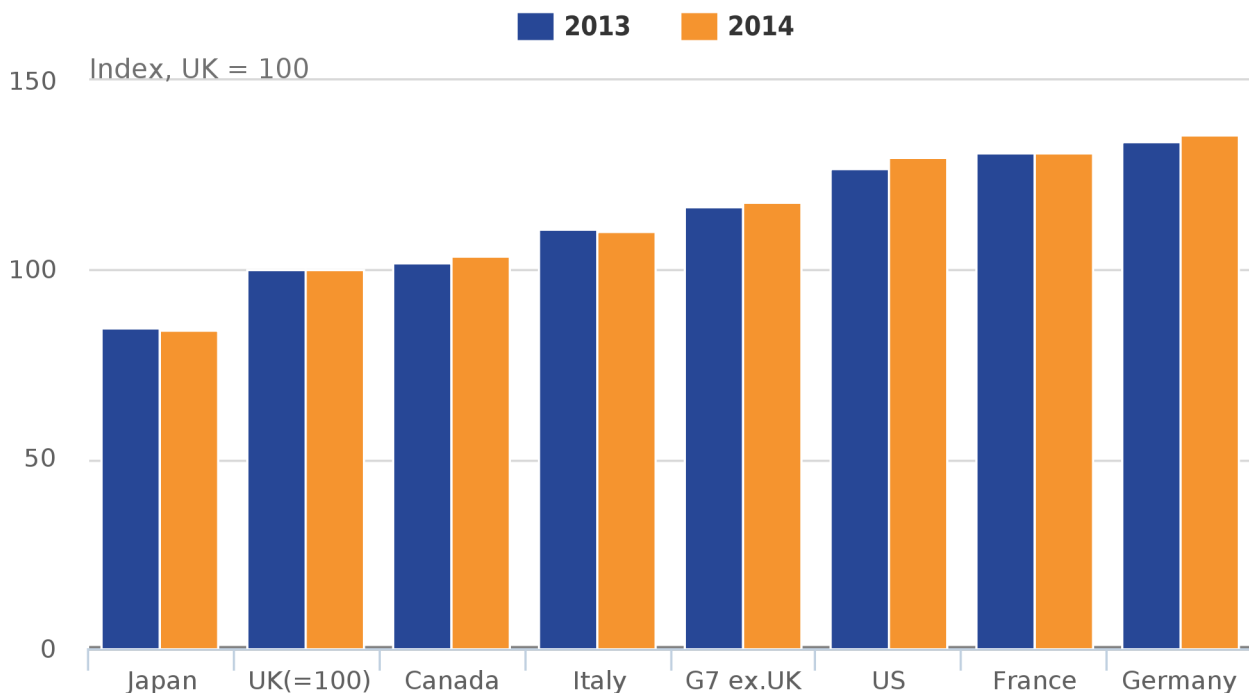
3. Current price productivity

Current price GDP per hour

UK productivity measured as GDP per hour ranked sixth out of the G7 countries in 2014. Productivity in Germany was 36% higher than in the UK, the widest differential ever recorded against a G7 country. Productivity in the rest of the G7 as a whole was 18% higher than in the UK, the largest differential since records began in 1991.

Figure 2: Current price GDP per hour worked, G7 countries

2013 and 2014



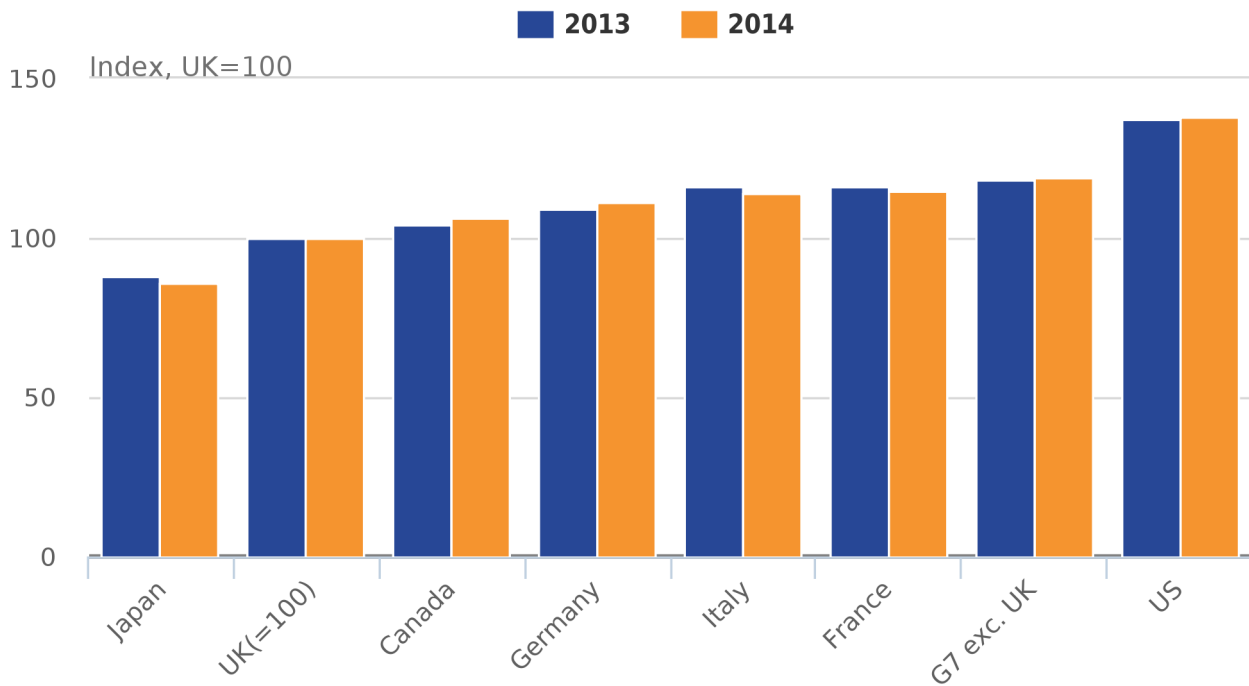
Source: Organisation for Economic Co-operation and Development

Current price GDP per worker

Similarly, final estimates for 2014 show that output per worker in the UK ranked sixth out of the G7 countries. The largest deficit on a per worker basis was relative to the US (38% above). In 2014, the gap relative to the rest of the G7 is slightly wider on this measure at 19%.

Figure 3: Current price GDP per worker, G7 countries

2013 and 2014



Source: Organisation for Economic Co-operation and Development

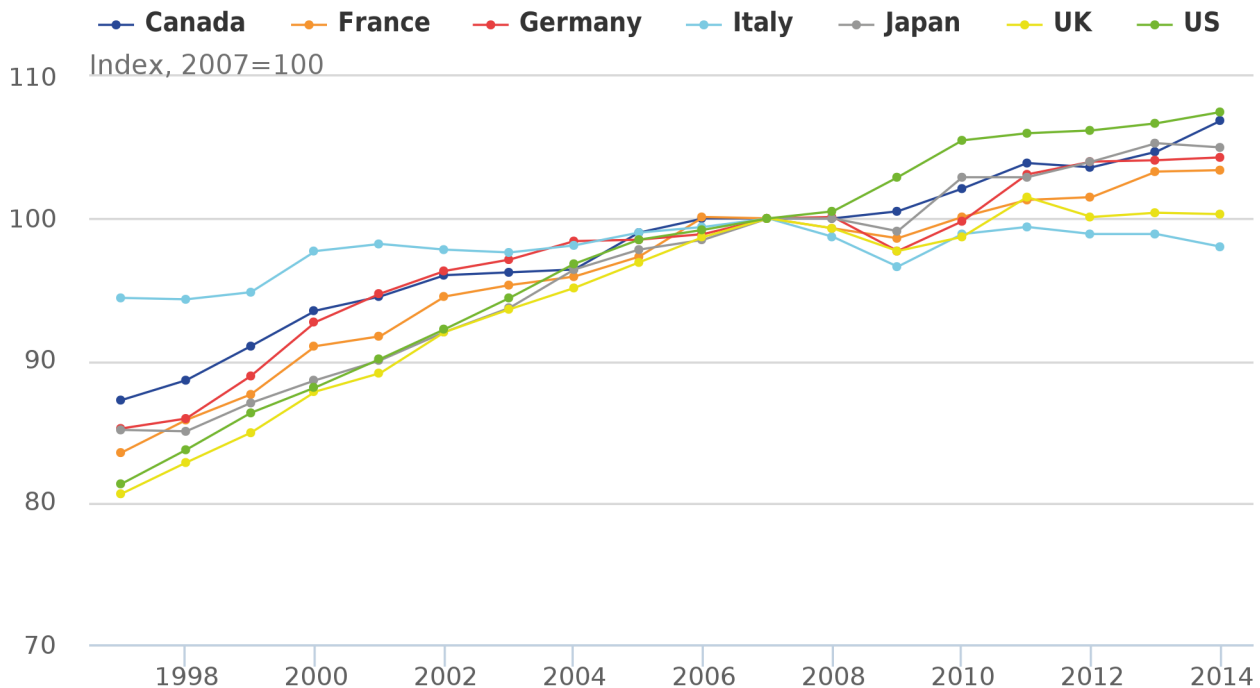
Different movements in average hours across countries account for differences in the patterns of productivity shown in Figures 2 and 3. For example, the productivity gap between the UK and the US is wider in terms of output per worker than in terms of output per hour because, on average, US workers work more hours than UK workers. On the other hand, the productivity differential between the UK and Germany is wider in terms of output per hour than in terms of output per worker, as German workers work fewer hours than their UK counterparts.

4. Constant price productivity

Figure 4 illustrates the difference in productivity trajectories over recent years between the main European economies on the one hand and North America and Japan on the other hand. Output per hour fell in most countries during the downturn in 2008 to 2009, before rebounding sharply in Japan, Canada and the US. But a slowdown in productivity growth can be observed in several countries before this; with German productivity growth slowing from 2004, whilst Italy has demonstrated no substantive productivity growth since 2000. Comparing average productivity growth rates since 2007 the UK ranks second bottom: only Italy has a weaker average productivity growth rate over this period.

Figure 4: Constant price GDP per hour worked, G7 countries

1997 to 2014



Source: Organisation for Economic Co-operation and Development

5. Productivity comparisons by industry

The rest of this article highlights differences in output per hour and output per worker for the manufacturing sector. Component level annual estimates are much more volatile than the whole economy estimates presented above. For this reason, the following commentary focuses on 5-year averages.

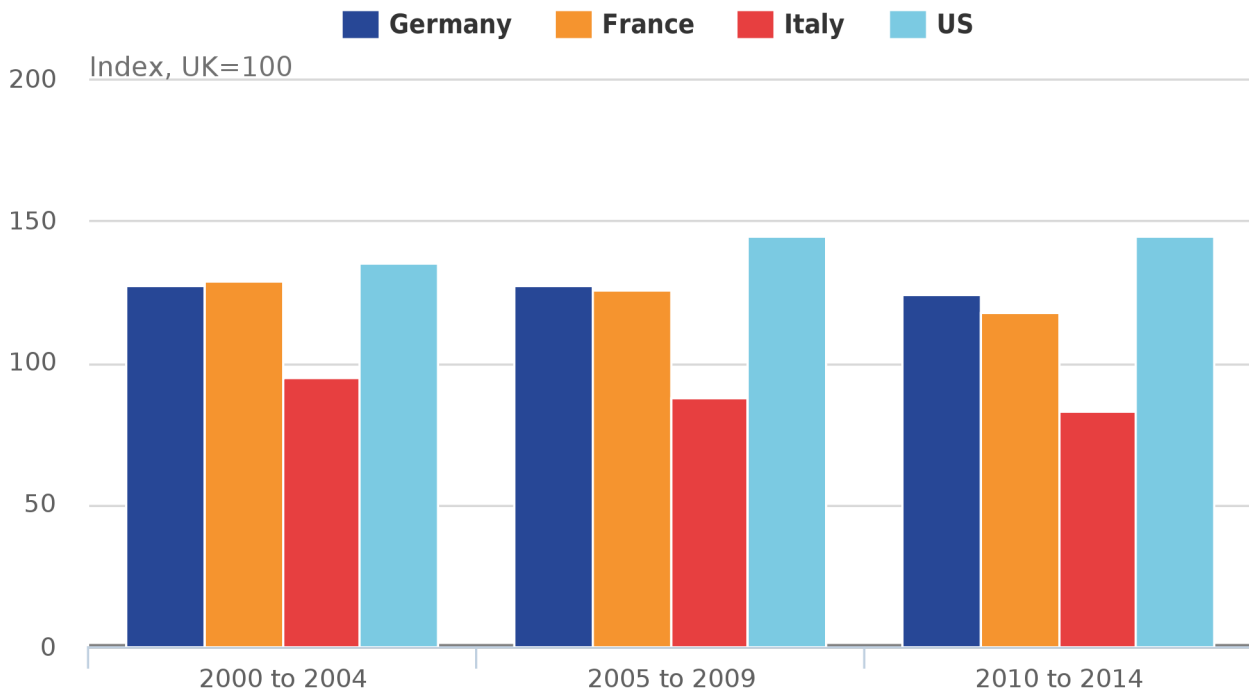
Manufacturing

For manufacturing, there are marked differences in comparisons based on output per worker and those based on output per hour worked. This reflects wide differences in average hours worked in manufacturing, with UK manufacturing workers putting in around 20% more hours on average than their French and German counterparts, but around 12% fewer hours than US manufacturing workers.

The outcome is that, over the 5 year period 2010 to 2014, German output per hour in manufacturing is estimated to be 24% above the UK, French manufacturing output per hour 18% higher and US manufacturing output per hour 45% higher. However, Italian manufacturing productivity is estimated to be 17% below the UK over this period (Figure 5).

Figure 5: Current price GVA per hour worked, Manufacturing

5 year averages 2000 to 2014

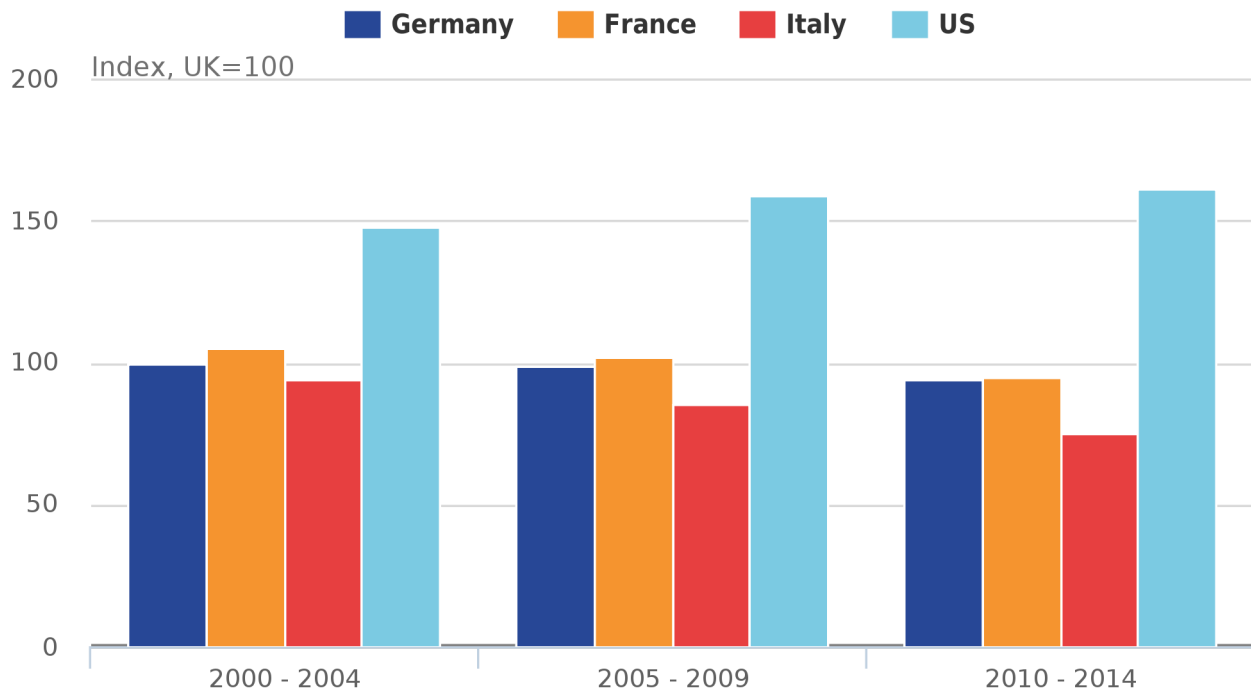


Source: Eurostat, Bureau of economic analysis, Bureau of labour statistics, Organisation for Economic Co-operation and Development

The comparison with the US is exacerbated in terms of output per worker (Figure 6). US manufacturing workers generate 61% more output than their UK counterparts. However, the gap reverses when comparing the UK with Germany and France and the UK's productivity lead over Italy widens to 25% over 2010 to 2014. Estimates for earlier 5-year periods suggest a trend deterioration in Italian productivity relative to the UK, but a trend for the US productivity advantage in manufacturing to widen.

Figure 6: Current price GVA per worker, Manufacturing

5 year averages 2000 to 2014



Source: Eurostat, Bureau of economic analysis, Bureau of labour statistics, Organisation for Economic Co-operation and Development