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Keywords: Economic History, Regional GDP, Real and Nominal Estimates

JEL classification: E01, N13, O47

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Estimates of Regional GDP in Great Britain in 1935 and 1938

Frank Geary¹, Belfast and Tom Stark², Portstewart

Abstract

Historical regional GDP series for the United Kingdom and for Great Britain for each of the census years between 1861 and 1961 are now largely complete though with no estimate for the wartime year, 1941. In the absence of data for this year, this note reports the data sources for and resulting estimates of regional GDP for the two years 1935 and 1938. Estimates are presented for both GB and the UK. They suggest that the worsening regional inequality observed between 1911 and 1931 continued to the mid-1930s with a reversal of this trend by 1938 that continued through to 1951. In addition we take the opportunity to consider two issues that arise from making long-term real terms estimates: first, what differences would emerge in the estimates had we used nominal data (where available); second what is the likely impact of base year on the long-term real estimates.

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1. Introduction

In a series of papers Geary and Stark have presented estimates of regional Gross Domestic Product (GDP) for the Standard Statistical Regions (SSRs) of the United Kingdom (UK) and for Great Britain (GB) beginning in 1861 for each of the Census years for which there are no official estimates: in effect between 1861 and 1961 with, unfortunately, no estimate for the wartime year, 1941. These are linked to official estimates to provide a consistent series for the UK between 1861 and 2011 and for GB for the years 1901 to 2001.³ This project is now largely complete. The estimates suggest that between 1861 and 2011 the measure of inequality for the regions of the UK and of GB displays, broadly speaking, a U shape with regional inequality declining in the nineteenth century and over the first half of the twentieth, though with a trend reversal between 1911 and 1931. Although convergence stalled between 1951 and 1971, the measure of dispersion of regional incomes remained at historic lows and the regions of Outer Britain⁴ experienced their fastest growth of the twentieth century between 1931/51 and 1971. However this process has gone decisively into reverse since 1991. London is at least 50% richer per capita than any other region and this has not been the case since the 1860s. Sigma dispersion has also returned to the levels of 150 years ago and there has been no beta type 'catch-up' now for more than half a century.⁵

³ Geary and Stark, 'Regional GDP'; *idem.*, 'What happened to regional inequality?'; *idem.*, '150 years of regional GDP' No series is presented for GB for the years 1861 to 1911. Estimates for these years may be obtained by removing Ireland from the UK. Note that with the departure from the UK of the 26 counties of the present-day Republic of Ireland in December 1922, GB estimates are obtained by removing Northern Ireland from the UK total.

⁴ Contemporaries distinguished between a relatively prosperous Inner Britain consisting of the South East, South West, London and Midlands and a depressed Outer Britain consisting of all the rest. Richardson, *Economic Recovery*, Ch.11.

⁵ Geary and Stark, 'Regional GDP'; *idem.*, 'What happened to regional inequality?'; *idem.*, '150 years of regional GDP'

An omission in this story is the absence of an estimate for any year between 1931 and 1951. Crafts' estimates for GB indicate a decline in inequality between 1911 and 1954/5. Geary and Stark's estimates generate a more nuanced picture suggesting that inequality worsened between 1911 and 1931 then diminished to 1951.⁶ This has the merit of reconciling characterisation of the first half of the century as the 'triumph of the South' with Crafts' measured fall in regional inequality between the start and the middle of the century.⁷ However the question remains, when did the post-1931 decline in regional equality begin? Does it have its origins in the recovery of the 1930s or is it attributable to the impact of wartime and immediate post-war changes? The purpose of this short note is to report the results of an attempt to rectify this omission. Lack of data prevents an estimate of regional GDP for 1941; in what follows we set out the details of estimates of regional GDP for the years 1935 and 1938. Estimates are presented for GB in the text and for the UK in appendix 1. In addition, we take the opportunity in appendix 2 to discuss some of the issues arising from presenting the estimates of regional GDP as shares in real rather than in nominal GDP.

2. Method, data and estimates

The estimate is made using the Geary-Stark method.⁸ It requires three sets of data: aggregate and sector GDP control totals;⁹ employment totals by

⁶ Crafts, 'Regional GDP in Britain'; Geary and Stark, 'Regional GDP'; Geary and Stark, 'What happened to regional inequality?'

⁷ Scott, *Triumph of the South*.

⁸ The method is outlined and tested in Geary and Stark, 'Examining Ireland's post-famine economic performance' and Geary and Stark, 'Regional GDP in the UK'. Simulation tests on

Standard Industrial Classification group and region and finally data from which regional productivity relatives can be derived (usually aggregate sector labour productivity and regional wages relative to national wages by sector) .

In the absence of a Census for 1941 and of regional wage data after 1938 we are restricted to an estimate for that year or earlier. Output control totals were obtained as for our UK estimates: official 1971 CSO total and sector GDP data initially in 1970 prices was linked to equivalent chained indices from Feinstein¹⁰. GB regional employment by sector is based on Lee's data for 1921, 1931 and 1951. We projected Lee's 1921 and 1931 figures forward to give an estimated sector allocation of the labour force in the 1930s and interpolated between his 1931 and 1951 figures to give alternative estimates. A similar exercise was carried out for Northern Ireland (NI). NI occupation returns were reclassified to conform to Lee's series. There were no censuses of population for NI in 1921 and 1931. Instead there were censuses in 1926 and 1937 only the former returning occupations. The estimates of employment by sector in NI for 1921 and 1931 are based on these two censuses.¹¹ The figures for 1935 and 1938 are obtained by projection and interpolation between the 1921 and 1931 estimates and the reclassified 1951 returns as outlined above for Lee's GB series. We report regional GDP estimates for both GB and the UK for 1935 and 1938 based on

the estimation procedures indicate that for the UK the method is an accurate predictor of regional GDP.

⁹ These are usually the broad sectors of agriculture, industry and services. Industry may be divided into sub-sectors such as mining, manufacturing and construction where sufficient data is available though, in a test that increased the industry division to six sectors, accuracy was not much improved.

¹⁰ Feinstein, *National Income*, T14, T15 and T24. The estimates via chain linking were subsequently converted to 2003 reference prices base.

¹¹ We projected the NI population for 1921 and 1931 from these two censuses and assumed the 1926 proportions of the industrial distribution of the labour force and those not occupied.

both the projection and the interpolation. Clearly an average will lie between these two bounds.

The wage relatives are calculated from a number of sources. The agriculture relatives were derived from data published in the Ministry of Labour Gazette on the principle changes of rates of wages for general male workers over 21 in agriculture. From this data we had wage rates covering 37 counties throughout Great Britain (26 in England and Wales and 11 in Scotland).¹² For 1935 the agricultural relatives are a time weighted average of those used for 1931 and 1938. The NI Ministry of Agriculture estimated that in 1936 the average weekly wage rate in agriculture in NI was about 68 per cent of that in England and Wales.¹³ We assumed this ratio held constant in the second half of the 1930s and applied it to the estimated averages for England and Wales to obtain estimates for NI.

For industry in 1935 the Census of Production (CoP) with 79% coverage of industrial employment was used.¹⁴ The 1938 relatives are a weighted average of 1938 specific data (29% coverage only) and the 1935 CoP. The 1938, wage data is for workers in various large cities in engineering, construction and printing during 1938¹⁵ and this was combined with regional wage data for 1938 from the *Ministry of Labour Gazette* on boot and shoe workers and workers in cotton, wool and worsted.¹⁶ These two sources give coverage of 29 per cent of industrial employment for the UK. Coverage varied

¹² Ministry of Labour Gazette issues for March, April, June, August, September, October and November, 1938 and 1939.

¹³ Isles and Cuthbert, *Economic Survey*, p227.

¹⁴ Board of Trade, *Census of Production*, 1935. Part I pp. 5, 6, 127, 312 and 402; Part II pp. 4, 5, 215 and 444; Part III pp. 7, 8, 250, 251 and 450; Part IV, section I, pp. 21-2, and 99; section II, pp. 4-5; section III, p. 4; section IV, pp. 4 and 94

¹⁵ Department of Employment and Productivity, *British Labour Statistics*, pp 28-37

¹⁶ Ministry of Labour Gazette January 1939

across regions from 0% in RSE to 61% in NI. They were combined with net output per employee data in each region from the 1935 CoP. The final weights adopted were 0.52 and 0.48 respectively.¹⁷ There were no 1938 wage or productivity data specific to the Rest of South East (RSE) region. In this case it was assumed that the overall South East (SE) relative could be a simple average of the 1935 SE relative and the 1938 specific one for London¹⁸. The subdivision of the SE GDP into the two sub-regions was based on the 1935 CoP proportions. These manipulations will we suspect tend to have increased regional disparity in 1938 and therefore not undermined the overall conclusion, suggested in Tables 1 and 2, that the trend to lower regional inequality identified between 1931 and 1951 started sometime after 1935.

As there was an absence of any information on service wages or any other type of indicator the relatives for services are calculated as a weighted average of the other two sectors using the 'Kravis effect' as justification.¹⁹

The resulting estimates of regional GDP, GDP per worker and GDP per head for 1935 and 1938 are set out below in Tables 1 to 3. Two estimates are presented: one based on employment numbers projected forward from 1921

¹⁷ The 1938 data was initially given a .75 weight then adjusted for low coverage:

In 1938 coverage of data was 0.29	Thus .29 x .75 equals	0.2175	0.52
1935 CoP coverage was 0.79	Thus .79 x .25 equals	0.1975	0.48

¹⁸ We experimented with a .25 and .75 weighted average but it made no difference to the SE share at whole number level.

¹⁹ Geary and Stark, 'Examining', pp. 922-3. Tests on the likely impact of reduced wage availability and limited service or no sector wage coverage indicate that the method is robust with respect to the available wage data, generating errors that lie within 2.8 percentage points of the acceptable official error even in the worst wage coverage case (using only agriculture and construction) Geary and Stark, 'Regional GDP', Table 8 and discussion, pp. 132-3.

and 1931, the other on interpolation between 1931 and 1951. For purposes of comparison, we include the relevant estimates for 1931 and 1951.²⁰

Table 1. Regional shares in GDP, GB

	1931	1921-31-35-38		1931-35-38-51		1951
		1935	1938	1935	1938	
<i>London</i>	23.3	24.5	22.8	24.7	23.0	20.5
<i>RSE</i>	15.7	17.3	17.1	16.1	15.0	13.6
South East	39.0	41.7	39.9	40.8	38.0	34.1
East Anglia	2.2	2.3	2.2	2.4	2.3	2.4
South West	5.9	5.9	5.8	5.9	5.9	6.1
West Midlands	8.0	8.0	7.9	8.3	8.3	9.4
East Midlands	5.4	5.6	6.0	5.5	5.7	6.3
North West	12.1	11.2	11.6	11.7	12.5	13.6
Yorks & Humberside	8.0	7.3	7.8	7.4	8.1	8.7
North	4.4	4.2	4.4	4.4	5.0	5.7
Wales	4.7	3.8	3.9	4.0	4.3	4.5
Scotland	10.2	10.0	10.5	9.7	10.0	9.3

Note: London is defined as the sum of the counties of London, Middlesex, and Surrey, as defined by Lee, *British employment statistics* (see Geary and Stark, 'What happened to regional inequality?' note to Table 1.

²⁰ Geary and Stark, 'What happened to regional inequality?', Tables 1-3. For purposes of continuity and comparison the dispersion and catch-up measures of these tables are included for the 1930s estimates presented here.

Table 2. GDP per worker (GB = 100)

	1921-31-35-38			1931-35-38-51		1951
	1931	1935	1938	1935	1938	
<i>London</i>	131.1	135.5	126.1	138.9	129.2	114.4
<i>RSE</i>	113.4	113.4	106.8	116.1	108.2	99.2
South East	123.4	126.0	117.0	128.9	120.1	107.8
East Anglia	87.6	92.0	90.5	94.1	91.8	94.1
South West	95.7	94.0	92.4	95.9	94.1	95.7
West Midlands	95.4	96.2	96.3	95.7	94.4	98.0
East Midlands	85.1	85.4	89.4	85.3	88.1	95.5
North West	87.9	84.7	91.7	84.7	91.0	99.2
Yorkshire & Humberside	87.1	80.8	89.4	80.5	87.9	95.7
North	81.1	80.3	88.8	80.2	88.5	95.5
Wales	98.8	83.4	90.1	83.9	90.3	96.0
Scotland	86.9	84.6	90.4	85.3	90.6	94.0
CV1	0.171	0.201	0.138	0.212	0.150	0.069
CV2	0.164	0.193	0.126	0.202	0.138	0.055
D	0.148	0.178	0.116	0.183	0.127	0.051
Catch-up factor on South East	34.2	41.7	27.1	42.3	30.7	11.4

Note: CV1 is coefficient of variation for all regions treating London and Rest of South East as separate regions. CV2 combines London and Rest of South East as one region, South East. D is the dispersion measure employed by Eurostat, Relative Mean Difference (see Geary and Stark, 'What happened to regional inequality?' note to Table 2 and fn 25). The catch-up factor measures the gap between the South East and the rest, see Geary and Stark, 'What happened to regional inequality?' p. 8 and fn. 28.

Table 3. GDP per person (GB = 100)

	1921-31-35-38			1931-35-38-51		1951
	1931	1935	1938	1935	1938	
<i>London</i>	144.2	149.7	138.1	155.7	147.1	138.6
<i>RSE</i>	114.0	122.5	119.5	112.9	102.8	84.8
South East	130.3	137.1	129.5	135.5	125.7	110.6
East Anglia	82.7	88.2	85.4	88.9	86.7	89.0
South West	92.3	93.3	92.0	91.9	89.7	89.3
West Midlands	95.7	95.3	93.0	97.2	96.6	104.0
East Midlands	86.6	89.9	95.2	86.6	89.3	95.8
North West	88.6	82.4	86.0	86.1	93.1	104.0
Yorkshire & Humberside	86.4	77.4	82.5	80.3	88.0	97.5
North	65.0	62.3	66.6	66.1	74.6	88.6
Wales	81.1	66.9	70.1	69.9	76.1	84.9
Scotland	94.2	94.0	101.1	90.1	93.9	89.3
CV1	0.226	0.272	0.221	0.271	0.216	0.175
CV2	0.210	0.262	0.215	0.245	0.178	0.091
D	0.181	0.226	0.184	0.183	0.155	0.132
Catch-up factor on South East	43.2	53.3	44.0	50.6	38.0	15.4

Notes: As for Table 2

In the absence of census and wage data for the war years, these estimates can be regarded as 'best guess' estimates of the likely movement in productivity and welfare across British regions in the 1930s and 1940s. The two distributions for the productivity and welfare measures are reassuringly close and show similar trends. Both suggest that the decline in equality and the process of catch up began in the 1930s. Regional inequality though, worsened to 1935 then diminished to 1938 and continued on this path through the war years and reconstruction. Participation rates will inevitably, drive a wedge between the productivity measure and the welfare measure. Nevertheless, GDP per head gives a similar trend.

3. Implications

These numbers broadly confirm the story told by Richardson about regional performance in the 1930s.²¹ He suggests a division of regions into two broad groups: the South and Midlands and the remainder in Northern England, Scotland and Wales. Output in the first group was dominated by consumption goods and services and construction both of which were focused on the domestic market. The other group, the regions of Outer Britain was dominated by the nineteenth century staples with their output dominated by exports. He argued that the more prosperous South and Midlands did not experience much of a depression and recovered much earlier than the rest of the country. In the Midlands, to some extent this was tempered by a reliance on engineering and exports. The Great Depression had a much greater impact on the regions of Outer Britain, 'there was little acceleration in recovery

²¹ Richardson, *Economic Recovery*, Ch. 11.

until after 1936, when these regions started to move into conditions of boom. This was a clear example of induced recovery. The formerly depressed industries revived quickly under the stimuli of revival in exports, rearmament, shortages of investment goods and industrial raw materials at home and abroad, and to a lesser extent government policy.²² This brief outline appears to be consistent with the worsening in regional inequality to 1935 followed by a decline thereafter shown in the estimates above.

The decline in regional inequality and the catch-up of the regions of Outer Britain on the South East continued through the period of war and post-war reconstruction. This was a decade of active regional policy which combined with changes in the structure of demand to boost the nineteenth century staples and the regions in which they were located. The pre-war demand conditions that favoured consumer goods industries now altered in favour of metals, engineering, vehicles and shipbuilding.²³ This, of course, enhanced the recovery trends of the second half of the 1930s, identified above, in the regions of Outer Britain. Policy further favoured these trends as industry was directed from the South East to 'safer' areas in the West and North. Law argues that effect was to 'slow the rate of growth in the core areas and raise the rate of growth in many of the assisted regions' which again is consistent with the trends identified in Table 1 to 3.²⁴ Similarly, post-war recovery with the need to make good domestic destruction, the export drive and a policy of directing production towards the assisted areas appears to have, at least, maintained this wartime trend. Considering then regional GDP performance between 1931 and 1951, it appears from the estimates

²² *Ibid*, p. 294-5.

²³ Youngson, *Britain's economic growth*, ch. 5.

²⁴ Law, *British Regional Development*, p. 222.

presented above that consistent with Richardson's characterisation the South East and Midlands escaped the worst effects of the Great Depression. The regions of Outer Britain did not begin to shake off its effects before the mid-1930s with the export boom and rearmament and then war and post-war recovery continued the regional recovery of the second half of the 1930s to push regional inequality to a one-hundred-year low by the early 1950s.

Appendix A1. Regional GDP, UK

These tables seek to fill the gap for the missing year 1941 in the UK series.²⁵

For purposes of continuity and comparison they are presented in the same format as this series. CV is the CV1 measure of tables 2 and 3 above treating London and RSE as separate regions. We have taken the opportunity to make slight revisions to the productivity estimates for 1931 which should have been included in the original series.²⁶ These are based on a recalculation of the service relatives for that year which the productivity estimates for 1931 did not take account of. The revised estimates reduce GDP per worker in the North West and marginally increase GDP per worker in London and RSE. The differences are small and make no difference to the conclusions. They do not affect the corresponding GB productivity estimates which take account of the changes to the service relatives.

Table A1.1 Regional Shares in UK GDP

		1921-31-35-38		1931-35-38-51		
	1931	1935	1938	1935	1938	1951
<i>London</i>	22.8	24.1	22.4	24.3	22.6	20.1
<i>RSE</i>	15.4	17.0	16.8	15.8	14.7	13.3
South East	38.3	41.0	39.1	40.1	37.3	33.4
East Anglia	2.1	2.3	2.2	2.3	2.3	2.3
South West	5.8	5.8	5.7	5.8	5.7	5.9
West Midlands	7.9	7.9	7.7	8.1	8.2	9.2
East Midlands	5.3	5.5	5.9	5.4	5.6	6.1
North West	11.9	11.0	11.4	11.5	12.3	13.3
Yorkshire & Humberside	7.9	7.2	7.7	7.3	7.9	8.5
North	4.3	4.1	4.3	4.4	4.9	5.6
Wales	4.6	3.7	3.8	3.9	4.2	4.4
Scotland	10.0	9.8	10.3	9.5	9.9	9.1
N Ireland	1.9	1.6	1.9	1.6	1.8	2.0

²⁵ Geary and Stark, '150 years of regional GDP'.

²⁶ Their omission is entirely an oversight on our part.

Table A1.2 GDP per worker (UK = 1)

	1921-31-35-38			1931-35-38-51		
	1931	1935	1938	1935	1938	1951
South East	1.25	1.29	1.18	1.31	1.21	1.08
<i>London</i>	1.33	1.38	1.28	1.41	1.31	1.15
<i>RSE</i>	1.15	1.16	1.08	1.18	1.09	1.00
East Anglia	0.89	0.94	0.91	0.95	0.93	0.95
South West	0.97	0.96	0.93	0.97	0.95	0.96
West Midlands	0.96	0.98	0.97	0.97	0.95	0.99
East Midlands	0.86	0.87	0.90	0.86	0.89	0.96
North West	0.89	0.86	0.93	0.86	0.92	1.00
Yorkshire & Humberside	0.88	0.82	0.90	0.82	0.89	0.96
North	0.82	0.82	0.90	0.81	0.89	0.96
Wales	0.99	0.85	0.91	0.85	0.91	0.97
Scotland	0.88	0.86	0.91	0.86	0.92	0.95
N Ireland	0.64	0.55	0.63	0.56	0.65	0.75
CV	0.182	0.215	0.150	0.224	0.160	0.080
Catch-up factor on South East	35.7	42.50	27.25	44.16	31.00	12.26

Table A1.3 GDP per person (UK = 1)

	1921-31-35-38			1931-35-38-51		
	1931	1935	1938	1935	1938	1951
South East	1.31	1.39	1.31	1.37	1.27	1.11
<i>London</i>	1.45	1.51	1.39	1.57	1.48	1.40
<i>RSE</i>	1.15	1.24	1.21	1.14	1.04	0.85
East Anglia	0.83	0.89	0.86	0.90	0.88	0.90
South West	0.93	0.94	0.93	0.93	0.91	0.90
West Midlands	0.97	0.96	0.94	0.98	0.98	1.05
East Midlands	0.87	0.91	0.96	0.88	0.90	0.97
North West	0.89	0.83	0.87	0.87	0.94	1.05
Yorkshire & Humberside	0.87	0.78	0.83	0.81	0.89	0.98
North	0.66	0.63	0.67	0.67	0.75	0.89
Wales	0.82	0.68	0.71	0.71	0.77	0.86
Scotland	0.95	0.95	1.02	0.91	0.95	0.90
N Ireland	0.69	0.60	0.69	0.59	0.67	0.73
CV	0.231	0.284	0.226	0.283	0.222	0.179
Catch-up factor on South East	31.0	55.49	43.69	52.87	38.02	16.37

Appendix A2. Real and Nominal Estimates: some issues

The estimates of UK regional GDP presented in this note and elsewhere for the census years 1861 to 2011 are in real terms and are presented as shares for ease of manipulation. The purpose of this appendix is twofold: first to explore the differences that would emerge in the estimates had we used nominal data (where available) and second to consider the likely impact of base year on the long-term real estimates.

A2a. Constant and current price estimates 1921 – 1961

There are equivalent current price estimates of GDP and its component sectors back to 1920 but not earlier which is why Geary and Stark opted to estimate real output over the entire 1861-1961 period. In Table A1 we compare the distributions based on the current price sector output estimates with those estimated by Geary and Stark in real terms. From 1931 onwards the two approaches produce almost identical distributions. The 1921 constant price estimates give a larger share of GDP to the South East regions and since these have by some margin the largest GDP per worker and per head then this increases the dispersion measures compared to the current price estimates. In both cases, however, the dispersion measures show an increase in inequality of regional average incomes from 1921 to 1931.

Table A2.1. Constant (1970) price and current price based regional GDP distributions, 1921-1961 (% Share GDP)

	1921		1931		1951		1961	
	curren t	constan t	curren t	constan t	curren t	constan t	curren t	constan t
South East	32.1	34.0	37.7	38.3	32.8	33.4	34.4	35.1
<i>London</i>	19.8	21.0	22.5	22.8	19.3	20.1	19.2	19.9
<i>RSE</i>	12.4	13.0	15.2	15.4	13.4	13.3	15.1	15.2
East Anglia	2.3	2.2	2.2	2.1	2.5	2.3	2.5	2.5
South West	5.8	5.8	5.8	5.8	5.8	5.9	6.0	6.0
West								
Midlands	6.9	6.6	8.0	7.9	9.5	9.2	9.7	9.5
East								
Midlands	5.6	5.3	5.4	5.3	6.4	6.1	6.2	6.2
North West	15.2	14.9	12.0	11.9	13.2	13.3	12.0	11.9
North	5.9	5.7	4.4	4.3	5.6	5.6	5.6	5.6
Yorks. &								
Humbersid								
e	8.6	8.2	8.0	7.9	8.6	8.5	8.1	8.0
Wales	4.8	4.7	4.6	4.6	4.5	4.4	4.6	4.6
Scotland	10.5	10.3	10.1	10.0	9.1	9.1	8.9	8.8
N. Ireland	2.4	2.2	2.0	1.9	2.1	2.0	2.0	2.0
CV per								
worker	0.112	0.154	0.170	0.182	0.063	0.080	0.066	0.081
CV per								
head	0.153	0.188	0.219	0.231	0.161	0.179	0.175	0.192
RMD per								
worker	0.091	0.128	0.140	0.152	0.042	0.053	0.048	0.063
RMD per								
head	0.124	0.148	0.171	0.175	0.123	0.135	0.127	0.135
ARD	3.7		1.3		2.2		1.4	

Sources: Geary and Stark, '150 years of regional GDP' Table3 for constant price estimates and reworked using current sector output values from Feinstein (1972) table 9 ppT26 and T27.

Note: Shares in this table and those below may not sum to 100 due to rounding.

A2b. Likely impact of base year on constant price estimates

Pre 1920 there are no sector current price estimates so no similar comparison is possible. We can however consider the effects of an alteration in the base year. As a matter for comparison we recalculate the Geary-Stark distributions for these years using sector real output projections backwards from a current price base in 1921²⁷. In Table A2.2 we compare the results for 1901 and 1911 using both Lee's series A and B estimates of employed persons²⁸ and in table

²⁷ Projections again based on Feinstein (1972) table 9 as in Table A1 above.

²⁸ The 1921 and later estimates are based on Lee's series B figures.

A2.3 we compare the 1861 to 1891 distributions all of which are based on Lee's series A numbers.

Table A2.2. 1970 and 1921 constant price estimates of regional GDP in 1901 & 1911

	1901		1901		1911		1911	
	SerA1970	SerA1921	SerB1970	SerB1921	SerA1970	SerA1921	SerB1970	SerB1921
South East	32.8	30.9	32.0	29.9	33.3	31.4	32.1	30.0
<i>London</i>	21.0	19.5	20.3	18.8	20.0	18.7	20.1	18.8
<i>RSE</i>	11.8	11.4	11.6	11.0	13.4	12.7	12.0	11.2
East Anglia	2.3	2.3	2.2	2.3	2.2	2.3	2.2	2.2
South West	6.0	5.9	5.9	5.8	5.9	5.8	5.8	5.7
West								
Midlands	6.4	6.6	6.6	6.7	6.5	6.6	7.0	7.2
East								
Midlands	5.3	5.6	5.4	5.7	5.4	5.6	5.7	5.9
North West	13.3	13.5	14.0	14.3	13.8	14.1	14.1	14.4
North	5.4	5.5	5.5	5.6	5.3	5.5	5.4	5.6
Yorkshire & Humberside	7.5	7.8	7.7	8.0	7.7	8.0	7.9	8.2
Wales	4.1	4.1	4.1	4.2	4.4	4.5	4.6	4.8
Scotland	10.1	10.4	10.3	10.5	9.6	9.9	9.6	9.9
Ireland	6.8	7.4	6.4	7.1	5.8	6.3	5.6	6.1
CV per worker	0.209	0.163	0.202	0.156	0.186	0.122	0.176	0.136
CV per head	0.220	0.180	0.224	0.213	0.217	0.177	0.215	0.180
RMD per worker	0.119	0.112	0.111	0.113	0.139	0.107	0.125	0.094
RMD per head	0.135	0.132	0.127	0.149	0.172	0.140	0.157	0.132
ARD (%)	3.6		3.9		3.5		3.9	

Note: The above estimates are derived from 4 sector estimates for regional GDP and this explains the very marginal differences from table A1 in Geary and Stark (2015) for the 1970 base estimates.

Sources: Geary and Stark, '150 years of regional GDP' Table 1 for 1970 constant price estimates and text above

Table A2.3. 1970 and 1921 constant price estimates of regional GDP, 1861 to 1891

	1871		1881		1891	
	1970	1921	1970	1921	1970	1921
South East	28.9	26.7	29.2	26.8	30.4	28.3
London	17.8	15.9	20.1	17.8	19.6	17.8
RSE	11.1	10.8	9.2	9.0	10.8	10.6
East Anglia	3.0	3.2	2.6	2.7	2.1	2.2
South West	8.4	8.4	7.3	7.2	6.2	6.2
West Midlands	6.7	6.6	7.2	7.3	7.0	7.1
East Midlands	4.6	5.1	4.9	5.1	4.6	4.8
North West	11.0	11.0	12.6	12.6	13.3	13.4
North	4.0	4.0	5.1	5.2	5.2	5.2
Yorks & Humberside	6.8	7.1	7.2	7.6	7.3	7.6
Wales	4.4	4.5	4.3	4.4	4.2	4.3
Scotland	10.2	10.4	9.7	10.4	10.4	10.8
Ireland	12.0	12.9	10.0	10.9	9.3	10.0
CV per worker	0.274	0.220	0.280	0.217	0.249	0.200
CV per head	0.280	0.226	0.295	0.233	0.241	0.194
RMD per worker	0.189	0.158	0.176	0.144	0.169	0.141
RMD per head	0.206	0.169	0.173	0.171	0.151	0.148
ARD (%)	4.0		4.1		3.2	

Source: Geary and Stark, '150 years of regional GDP' Table 1 for 1970 constant price estimates and text above

In Tables A2.2 and A2.3 the regional shares outside the South East are identical at whole number level and the maximum differences range from 0.5 to 0.7 percentage points and these are for Ireland. The 1921 base in all years and both for A and B series gives marginally higher shares for Ireland.²⁹ On the other hand the shares for the South East are on average one and a half percent lower – mostly due to the share of London. The South East and Irish differences result in lower dispersion measures though the inequality trends over time and with respect to 1921 remain unaffected.

²⁹ These larger shares still confirm the conclusion that in terms of output per worker Ireland was catching up Great Britain – from a 59% ratio in 1861 to 66% in 1911 and no more than 30% of Ireland's growth performance can be attributed to emigration.

Differences in the bases for constant price estimates and current valuations imply that variations in relative sector GDP are not only dependent on changes in real output per head and the number of workers but also on changes in the implicit 'price' per unit of output. We set out the different sector per cent contributions under various base years in table A4. We have no answer to the question which is the correct procedure. Fortunately the differences are not sufficient to alter estimates of the basic structure of UK regional GDP and changes in structure over time.

Table A2.4. Sector Shares in GDP: selected years by various base years.

		Agriculture	Industry	Services
1861	<i>1970 base</i>	11.0	25.3	63.7
	<i>1921 base</i>	18.5	30.9	50.5
1881	<i>1970 base</i>	7.3	29.0	63.6
	<i>1921 base</i>	12.5	35.7	51.8
1901	<i>1970 base</i>	4.9	30.3	64.9
	<i>1921 base</i>	8.4	37.5	54.0
1921	<i>1970 base</i>	3.6	29.5	66.8
	<i>current price</i>	6.3	36.7	56.9
1931	<i>1970 base</i>	3.2	33.4	63.4
	<i>current price</i>	4.0	35.9	60.0
1961	<i>1970 base</i>	2.8	43.6	53.5
	<i>current price</i>	4.1	47.5	48.4
1971	<i>1970 base</i>	2.9	43.2	53.9
	<i>current price</i>	2.9	43.1	54.0
2001	<i>1970 base</i>	0.9	26.3	72.8
	<i>current price</i>	0.9	26.3	72.8

Source: Estimates derived from Feinstein (1979) Tables 8 and 9 ppT24-T26 , gvanuts1_tcm77-291856 table1.11, Blue Book1982 table1.9 and 1977 table2.1 and unpublished estimates by Geary and Stark

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